

FM 55-46

DEPARTMENT OF THE ARMY FIELD MANUAL

ARMY AIR TRANSPORT OPERATIONS

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ARMY AIR TRANSPORT OPERATIONS

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Purpose and Scope

a. This manual provides guidance for commanders, staff officers, and other interested personnel concerned with the utilization of Army air transport employed in combat service support operations. Although emphasis is directed to combat service support, the air transport units referred to in this manual also participate in combat support operations when directed by the appropriate commander. Detailed information concerning the use of Army air transport in airmobile operations is published in FM 57-35 and FM 1-100. This manual does not change or rescind the role of the U. S. Air Force in providing the Army with air transport as established by current policy and directives. The provisions of the Army-Air Force agreement of 6 April 1966 (app D) concerning the control and employment of certain transport aircraft are included where applicable.

b. This manual describes the organization, mission, assignment, capabilities, limitations, and type aircraft of Army air transport units. It includes the normal duties and responsibilities of key aviation personnel. This manual covers the operational relationship between Army air transport units and supported units. It covers principles of employment, typical missions, and operational procedures related to the movement of personnel and cargo by Army transport aircraft. It also covers air line of communication operations in support of an airmobile division and other Army forces. In addition, this manual includes characteristics of the U. S. Air Force C-7 fixed-wing transport aircraft.

c. The material presented herein is applicable without modification to general, limited,

and cold war, and to internal defense and development operations.

d. Users of this manual are encouraged to submit comments and recommendations for changes that will improve the clarity, accuracy, and completeness of the manual. Comments should be constructive in nature, and reasons should be provided to support all recommendations, to insure understanding and to provide valid bases for evaluation. Each comment should be keyed to a specific page, paragraph, and line of the text. Comments should be forwarded to the Commanding Officer, USACDC Transportation Agency, Fort Eustis, Va. 23604. An information copy of recommendations that propose changes to approved Army doctrine may be sent through command channels, to the Commanding General, U. S. Army Combat Developments Command, Fort Belvoir, Va. 23801.

2. Mission of Army Air Transport Units

The mission of Army air transport units is to provide airlift of personnel and cargo for combat service support and combat support operations as required.

3. Requirements for Army Air Transport

The evolution of warfare has generated a need for greater mobility in support of the Army. It is essential that today's Army be capable of sustaining itself when operating in all types of environmental conditions. The complex transportation requirements of a modern mobile army demand coordination of all available transportation, proper planning, and adequate control of operations to achieve an acceptable degree of economy and utilization of resources. Army air transport is an integral part of the transportation system designed to provide efficient and effective movement of per-

sonnel and cargo. Army air transport units provide airlift in support of requirements of theater army, field army, corps, and division. Additionally, air transport units provide airlift in support of a unified or specified command, a military assistance advisory group or mission operating detachment, and a separate brigade conducting internal defense and development operations. The threat of nuclear weapons, together with the diversified types of missions confronting the Army, has placed greater emphasis on dispersion and has imposed

heavy demands on lines of communication. A need exists to move equipment, personnel, and bulk cargo at speeds and distances commensurate with the requirements of the tactical forces. Because of the mission versatility and responsiveness of Army air transport, considerable reliance is placed on this mode of transportation. All of these considerations emphasize the fact that Army air transport must be efficiently organized and effectively employed to insure success in supporting today's Army requirements.

Section II. COMMAND AND STAFF RELATIONSHIPS

4. Communications Zone

a. The relationship of the theater army and the Theater Army Logistical Command (TALOG) so far as it affects transportation is described in FM 55-6. Broadly stated, the theater army commander is responsible for the use of the transport capability allocated to the theater army. The theater army delegates to TALOG the responsibility for administering the use of Army-allocated transport capability. This includes the Army portion of intratheater airlift provided by other services (Air Force and Navy).

b. The TALOG transportation officer, under the staff supervision of the TALOG director of services, is responsible to the TALOG commander for movement planning and for coordination of airlift allocated to TALOG. Intratheater airlift allocated to TALOG is used for personnel and cargo movement within a theater of operations. For a more complete discussion of intratheater airlift provided to the Army by other services, see FM 100-10.

c. In addition to the Army-allocated portion of the intratheater airlift provided by other services, the theater army commander may allocate certain available Army air transport to TALOG for operations within the communications zone (COMMZ). The concept of dispersing facilities and installations in a theater of operations to avoid providing profitable targets to an enemy requires that the TALOG commander have an Army air transport capability within the COMZ available to accomplish the following tasks:

- (1) Rapid deployment of rear security forces and area damage control personnel throughout the COMMZ.
- (2) Movement of personnel and cargo between Air Force terminals and Army depots or other Army installations.
- (3) Lateral transport of high-priority cargo between facilities and installations.

d. Such tasks would be supported with Army air transport only when suitable aircraft of the other services are not available. Existing agreements and joint directives among the services concerning the functions of aircraft in support of the Army will be recognized and adhered to.

e. The Army air transport units available to support tasks originating in COMMZ are described in chapter 2. The amount of Army airlift available to TALOG is dependent on the specific requirements generated in COMMZ.

f. The TALOG transportation officer is responsible to the TALOG commander for the allocation of Army air transport to support COMMZ requirements. Technical advice concerning the employment of Army air transport units is provided by the appropriate Army aviation officer.

5. Field Army

a. The field army is the largest self-contained U. S. Army organization capable of sustained combat, combat support, and combat service support operations. It consists of a headquarters, certain organic Army troops, service support troops, and a variable number of corps and divisions. The type and number of troop

units assigned or attached are tailored for specific missions and operations. Based on the concept of modern warfare, the field army generally includes an area 135 to 360 kilometers (73 to 195 nautical miles) in width and 150 to 300 kilometers (81 to 162 nautical miles) in depth.

b. The Field Army Support Command (FASCOM) is established as a major subordinate unit of the field army to command and control field army service support units and operations. FASCOM provides service support primarily through two kinds of subordinate elements—support brigades and Army-wide service organizations. The support brigades provide supply, maintenance, and certain other services in a designated area. Army-wide services are provided throughout the field army by major subordinate units of FASCOM. Army-wide transportation services are provided by a transportation brigade.

c. The transportation brigade (fig. 1) is a

major subordinate unit of FASCOM, providing transportation combat service support and, when called upon by the field army command, also providing transportation combat support. Army transport helicopter units are an essential element of the transportation brigade. The ability of these air transport units to move personnel and cargo at comparatively high speed and with little regard to natural obstacles generates a considerable demand for their use. Normally, there are never enough Army transport aircraft to satisfy all of the field army requirements. However, the extensive geographical area in which Army transportation services must operate makes it essential that an established amount of airlift be available to the transportation brigade on a continuous basis. Accordingly, those Army transport aircraft assigned to provide Army-wide combat service support airlift, except aeromedical evacuation helicopters, are under the control of FASCOM and are assigned to an aviation group in the transportation brigade.

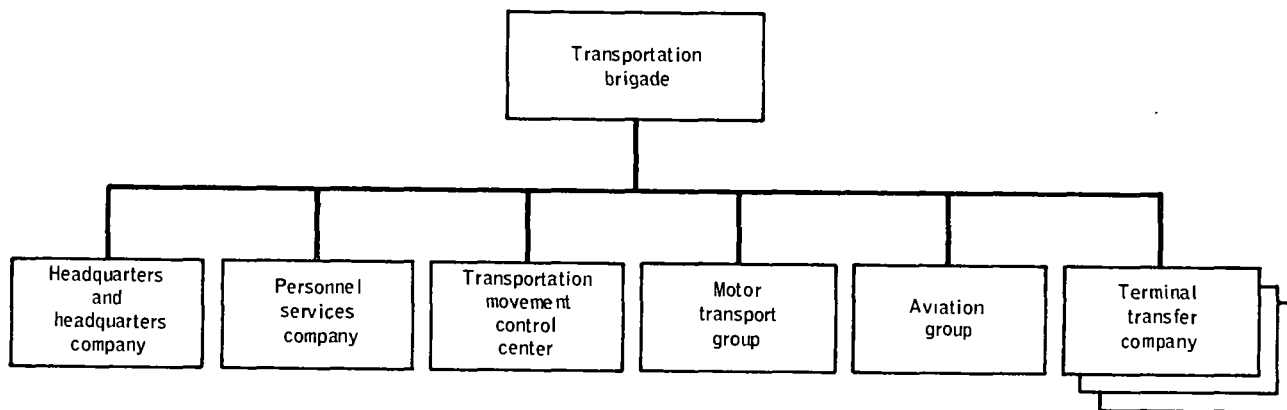


Figure 1. Transportation brigade.

d. The heavy demand for use of the airlift capability of Army air transport helicopter units makes centralized control essential. When these aircraft are employed in their primary role of combat service support they are controlled as outlined in c above. However, these aircraft must also provide combat support to the field army when required. When they are directed to a combat support operation, they operate under the control of the tactical commander of the force supported for that par-

ticular movement. The tactical commander is then responsible for their prompt return to FASCOM control at the completion of the operation. Combat support operations are covered in greater detail in chapter 4.

6. Unified or Specified Commands

a. Unified or specified commands are organized for broad continuing missions. Such commands may provide the command and control of forces engaged in internal defense and

development operations. Unified commands normally assume military control over military assistance advisory groups and missions located within their area of interest. When U. S. foreign assistance to a host country (HC) includes sizeable U. S. combat, combat support, and combat service support forces, a subordinate unified command or a military assistance command may be organized.

b. A support command normally will be established as a major subordinate unit of the Army component of a subordinate unified command or military assistance command to provide command and control of Army service support units and operations. Transportation units may be assigned to the support command in quantity and by type needed to provide efficient transportation services. When the operations attain major intensity, a transportation brigade or transportation composite group will normally be assigned to the support command to provide combat service support and, when called upon by the appropriate tactical commander, also to provide combat support.

c. Internal defense and development assistance operations require a considerable amount of Army air transport support. Operations in this type of an environment are characterized by a high degree of mobility and maneuvering, organization of fires, and utilization of terrain. There is the constant threat of insurgent activity and the disruption of the HC normal means of transportation. Opposing forces usually are dispersed throughout the HC and the operational environment cannot be identified by an FEBA (forward edge of the battle area) or by the continuous lateral disposition of forces.

d. The heavy demand for airlift makes centralized control of Army air transport units essential. When these units are providing combat service support, they will operate under the control of the support command. When these units are requested to provide airlift for combat support operations, they will operate under the control of the appropriate U. S. tactical commander or senior U. S. adviser of the force supported.

Section III. EMPLOYMENT CONSIDERATIONS

7. General

The inclusion of Army transport helicopters in the Army-wide transportation services has added a mode that can provide rapid movement of personnel and cargo over broad areas with little regard for surrounding terrain. However, this mode has also introduced certain operational factors that must be recognized and understood in order that adequate support can be safely accomplished. Personnel involved with the utilization and employment of Army air transport are provided technical guidance and advice from qualified Army aviation personnel. In addition, applicable employment principles and certain operational considerations that affect the capability of this mode of transportation are discussed in this section.

8. Principles of Employment

a. *Economy of Utilization.* Several factors must be considered in evaluation of this principle. Army transport aircraft must be available to support both combat service support and

combat support operations. These aircraft generally are in great demand, are relatively expensive to operate, and require more hours of maintenance per operating hour than surface transportation. Transport aircraft should not be employed when another mode of transportation can effectively accomplish the mission. In addition, when a mission is approved, economy can be effected by using the proper type of transport aircraft. As an example, it is usually more efficient and economical to schedule medium transport helicopters for troop movement and resupply operations and to reserve the heavy lift helicopters for operations involving movement of heavy items over short distances.

b. *Freedom of Utilization.* Freedom of utilization permits a commander to employ organic, attached, or supporting Army aviation units in a way which contributes most to the successful accomplishment of his mission. When Army air transport is providing combat service support, it is normal for the appropriate support commander to retain centralized control of

these units. However, when Army air transport provides combat support, the units normally are placed under the operational control of the appropriate tactical commander.

c. Ready Availability. The ability to respond rapidly to demands for Army air transport increases the value of this mode of transportation to supported commanders. Ready availability is obtained by locating aviation units as close as practical to the supported units. Also, the aircraft's inherent mobility permits support to be made available to units that are located throughout a wide area. Ready availability is also obtained by intelligent scheduling of operational aircraft and by programming of required maintenance.

9. Operational Considerations

a. Air Density. Unlike surface modes of transportation, where the payload of a particular vehicle is relatively fixed, aircraft are affected by air density, which in turn influences the payload that can be carried on a specific mission. Simply stated, any volume of air is less dense than the air on which it rests. Therefore, air is less dense at higher altitudes. At lower levels of altitude, the denser air offers more support (lift) and consequently an aircraft performing in this lower element performs more efficiently. Denser air provides greater lift to an aircraft's wing or rotor blade, thus increasing the weight-lifting performance of the aircraft. Air density is affected by temperature, altitude, and humidity.

(1) *Temperature.* An increase in temperature causes a decrease in air density. The amount of air that occupies 1 cubic inch at a low temperature will expand and occupy 2 or 3 cubic inches as the temperature goes higher. It is important to recognize that the payload of a particular aircraft can change, depending on the time of day when a flight is scheduled. Usually, early morning temperatures favor operations and noontime heat causes a decrease in the efficiency of the aircraft.

(2) *Altitude.* An increase in altitude causes a decrease in air density. The

thin air at high altitudes causes a lessening of aircraft operating efficiency. This factor is particularly important when operating from landing sites located high above sea level. It is necessary either to decrease the payload or to increase the length of the landing strip.

(3) *Humidity.* An increase in humidity causes a decrease in air density. Air always contains some moisture in the form of water vapor, but the amount varies from almost none to 100 percent. This water vapor is known as humidity. As the humidity increases, water particles displace air, causing a decrease in air density and reducing the performance of an aircraft.

b. Distance. The distance to be flown is particularly important when utilizing Army air transport because the allowable cargo load placed aboard each aircraft is computed after the amount of fuel, plus reserve, is determined. Aircraft must carry less fuel with a relative reduction in distance flown when maximum payload is desired, and payload is reduced when maximum distance is the important factor.

c. Aircraft Availability. Aircraft availability is directly influenced by the operational readiness of the air transport units. Proper scheduling of aircraft during operations and efficient maintenance favorably affect aircraft availability. During periods of sustained operations, most reliable and effective airlift is provided when the air transport units program a percentage of assigned aircraft as available on a daily basis. This percentage will vary with the type and model of aircraft assigned. Given time and support, air transport units can provide maximum availability of aircraft for individual or special operations. However, intense preparation should not be considered as normal, and the extra effort expended to obtain a maximum availability of aircraft decreases the long-range effectiveness of the unit.

d. Weather. Weather conditions influence the operations of Army air transport units. While low ceilings and limited visibility may restrict operations, such conditions may be used to advantage in shielding the aircraft from

enemy observation. However, adverse weather generally reduces the efficiency of Army air transport operations. Although Army transport aircraft can operate under instrument flight conditions, commanders should establish weather minimums to preclude scheduling flights that jeopardize the safety of aircraft and personnel. Weather minimums should be established commensurate with the experience of the pilots, type of aircraft employed, urgency of mission, navigational aids available, terrain along the flight route, and time of operation.

e. Enemy Situation. The location and capabilities of enemy forces should be considered before flight routes for Army air transport operations are finalized. Every effort should be made to avoid areas known to contain enemy ground fire, particularly areas containing anti-aircraft weapons. Air transport units should have prearranged evasive-action flight plans in the event that enemy aircraft are encountered.

f. Terrain. Army air transport is less affected by terrain obstacle than are other modes of transportation. However, terrain features must be considered for each operation. Terrain influences the following:

- (1) Location of takeoff and landing sites.
- (2) Flight routes.
- (3) Identification of prominent landmarks for navigational purposes.
- (4) Location of navigational aids.
- (5) Location of emergency landing sites.

g. Crew Member Requirements. The availability of rated crew members has an important effect upon the operational capability of aviation units. Requirements for crew members increase considerably in Army air transport units providing combat service support on a sustained basis. Certain scheduled operations may require that double crews be assigned to a unit to insure completion of a mission. Commanders with assigned or attached aviation units are responsible to insure that crew members are assigned to flights in such a manner as to provide adequate safety of operations. Such commanders may also establish local flight time limits for crew members. As a guide, crew members who operate in rotary wing transport

aircraft should be limited to 70 hours per month. For detailed guidance concerning crew member requirements, see AR 95-17.

h. Vulnerability. Army air transport should be operated and employed in such a manner as to insure a reasonable degree of safety commensurate with the assigned mission. While losses in combat that can be directly attributed to enemy action must be anticipated, such losses can be held to a minimum if sound judgment is used and the aircraft's limitations are recognized. Losses can be reduced by proper coordination and by the use of surprise, maneuver, proper flight techniques, ground security, fire support, and armed aerial escort.

i. Flight Routes. Many demands for the use of available airspace are generated during combat operations. The employment of aircraft of the Army and other services, artillery, drones, and missiles must be coordinated to insure adequate safety, proper identification, and efficiency of operations. Army air transport units are responsible to insure that flight routes are properly coordinated and approved by the appropriate air traffic control facility before commencing combat service support or combat support operations.

j. Communications. Combat service support and combat support airlift operations require that adequate communications be established before the beginning of a mission. Voice communication is necessary among the following: Army air transport task and command units, supported organizations, in-flight aircraft, and takeoff and landing sites.

10. Aircraft Characteristics

a. General.

- (1) Army aircraft are capable of operating in the environment of the ground soldier. These aircraft are rugged in design, are highly maneuverable, are capable of short takeoff and landing or vertical takeoff and landing (STOL/VTOL), and can be maintained under field conditions. Army fixed wing aircraft can operate from small, unimproved airstrips or fields, and helicopters can operate from areas unsuited for fixed wing operations.

- (2) The characteristics of the Army CH-47 and CH-54 helicopters and the U. S. Air Force C-7 fixed-wing aircraft described in *c* through *e* below are given only as a guide for preliminary planning. Actual allowable cargo loads vary greatly because of temperature changes, elevation, winds, and other variables existing at the time of the operation. It must be understood that these variables preclude the possibility of providing a figure for the allowable cargo load that will remain constant. Detailed characteristics and planning factors for Army aircraft range, payload, and fuel consumption may also be found in FM 30-30, FM 55-15, and FM 101-10-1.

b. Terms.

- (1) *Basic weight.* The empty weight of an aircraft in its basic configuration, including all appointments, integral equipment, instrumentation, and trapped fuel and oil but excluding passengers, cargo, crew, and usable fuel and oil.
- (2) *Operating weight.* The basic weight plus the variables which remain substantially constant for a mission. These items include the crew, crew's baggage, emergency equipment, and oil, but passengers, cargo, and usable fuel are excluded.
- (3) *Gross weight.* The total weight of the loaded aircraft and its contents.
- (4) *Useful load.* The load-carrying capability of an aircraft. It includes the passengers, cargo, crew, and usable fuel and oil required for a mission.
- (5) *Allowable cargo load.* The maximum weight in pounds of personnel and/or cargo which may be flown for a specific mission. The allowable cargo load is also referred to as the payload.

c. CH-47A Chinook.

- (1) *Description.* The CH-47A (fig. 2) is is a medium transport helicopter powered by two 2,200-horsepower tur-

bine engines (mounted on the aft fuselage and driving tandem, three-blade rotors) simultaneously. The helicopter is equipped with a nonretractable quadricycle landing gear. It has a power-operated rear loading ramp, which permits straight-in loading. The sealed hull gives the CH-47A a water landing capability.

(2) *Dimensions.*

- (a) Length of fuselage: 51 feet.
- (b) Length with rotor blades unfolded: 98 feet 3¼ inches.
- (c) Extreme height: 17 feet 11 inches.
- (d) Diameter of rotor: 59 feet 1¼ inches.

(3) *Cargo transport provisions.*

(a) *Cargo compartment.*

1. Height of floor above ground: 2 feet 6 inches.
2. Usable length: 30 feet 6 inches.
3. Floor width: 7 feet 6 inches.
4. Height: 6 feet 4 inches.

(b) *Cargo door.*

1. Width: 7 feet 6 inches.
2. Height: 6 feet 4 inches.

(c) *External cargo.*

1. Maximum hook or sling capacity: 16,000 pounds.
2. Rescue hoist capacity: 600 pounds.
3. Cargo loading winch capacity: 3,000 pounds.

(4) *Troop transport provisions.*

- (a) Troop seats: 33.
- (b) Medical patients: 24 litter cases, plus 3 ambulatory cases.

(5) *Operational characteristics (computed at standard conditions at sea level).*

- (a) Maximum gross weight: 33,000 pounds.
- (b) Operating weight: 17,154 pounds.
- (c) Fuel capacity: 4,090 pounds.
- (d) Allowable cargo load (50-nautical-mile radius): 13,000 pounds.
- (e) Allowable cargo load (100-nautical-mile radius): 11,756 pounds.
- (f) Cruising speed: 110 knots
- (g) Fuel consumption per hour (computed at maximum gross weight at sea level): 1,300 pounds.



Figure 2. CH-47A Chinook.

d. CH-54A Skycrane.

- (1) *Description.* The CH-54A (fig. 3) is a twin-turbine, single-main-rotor helicopter equipped with one antitorque tail rotor. It is a heavy-lift helicopter capable of external transport of jettisonable cargo loads. Provisions for the attachment of cargo or personnel vans (nonjettisonable) are also incorporated. The fuselage is constructed in a crane configuration. The cockpit area provides seating for five persons. There is side-by-side seating for the pilot and a copilot. From an aft-facing position, a third pilot, called the remote pilot, is able to control the aircraft and its external loads during loading and unloading operations through a set of flight and cargo handling controls. The two remaining

seats can be occupied by a flight engineer and one additional individual.

- (2) *Dimensions.*

- (a) Length of fuselage: 70 feet 3 inches.
- (b) Length with rotor blades unfolded: 88 feet.
- (c) Extreme height: 24 feet 10 inches.
- (d) Diameter of main rotor: 72 feet.
- (e) Main landing gear tread: 19 feet 9 inches.
- (f) Ground clearance under fuselage: 9 feet 4 inches.

- (3) *Troop and cargo compartment (detachable pod).*

- (a) Inside length: 34 feet 9 inches.
- (b) Inside height: 6 feet 5 inches.
- (c) Inside width: 11 feet 6 inches.
- (d) Empty weight of detachable pod: 3,300 pounds.

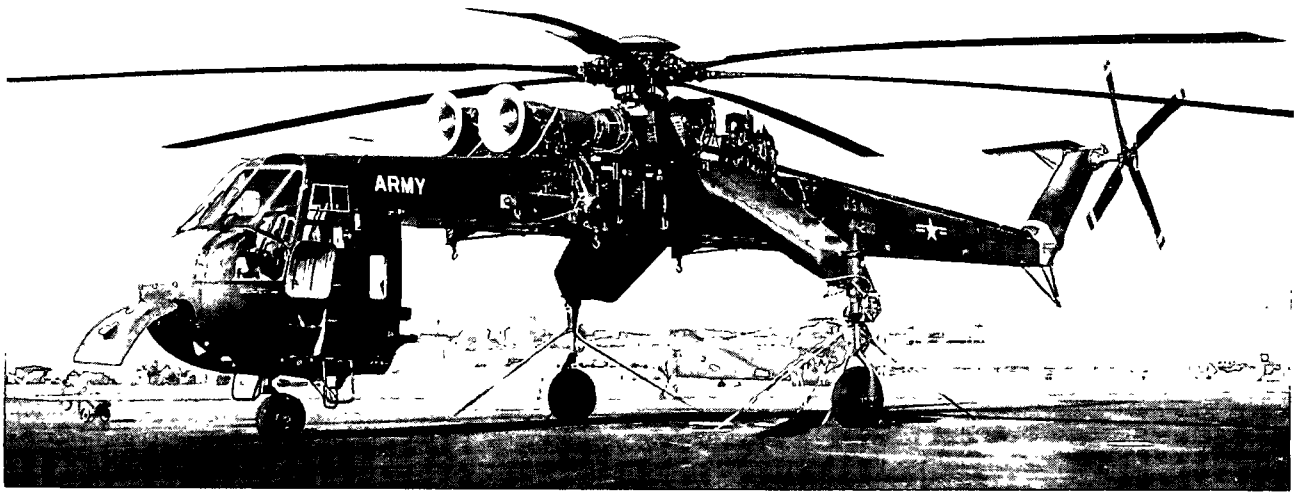


Figure 3. CH-54A Skycrane.

(4) *Troop transport provisions (detachable pod).*

- (a) Troops: 68.
- (b) Medical patients: 48 litter cases.

(5) *External cargo provisions. Maximum hook or sling capacity: 20,760 pounds.*

(6) *Operational characteristics (computed at standard conditions at sea level).*

- (a) Maximum gross weight: 42,000 pounds.
- (b) Operating weight: 19,000 pounds.
- (c) Fuel capacity: 5,720 pounds.
- (d) Allowable cargo load (10-nautical-mile radius): 20,680 pounds.
- (e) Allowable cargo load (25-nautical-mile radius): 19,520 pounds.
- (f) Cruising speed: 95 knots.
- (g) Fuel consumption per hour (computed at maximum gross weight at sea level): 3,460 pounds.

e. *Air Force C-7 Caribou.*

- (1) *Description.* The Air Force C-7 (fig. 4) is an all-metal, high-wing monoplane powered by two 1,450-horsepower reciprocating engines. The aircraft has a fully retractable tricycle

landing gear and a power-operated cargo door and ramp which, in conjunction with the upswept rear fuselage, permit straight-in cargo loading.

(2) *Dimensions.*

- (a) Length of fuselage: 72 feet 7 inches.
- (b) Extreme height: 31 feet 9 inches.
- (c) Wingspan: 95 feet 7½ inches.

(3) *Cargo transport provisions.*

(a) *Cargo compartment.*

- 1. Height of floor above ground: 3 feet 9½ inches.
- 2. Usable length: 28 feet 9 inches.
- 3. Floor width: 6 feet 9 inches.
- 4. Height: 6 feet 3 inches.
- 5. Cargo space: 1,150 cubic feet.

(b) *Cargo door.*

- 1. Width: 6 feet 11½ inches.
- 2. Height: 6 feet 2 inches.

(4) *Troop transport provisions.*

- (a) Troop seats: 32.
- (b) Medical patients: 14 litter cases, plus 8 ambulatory cases.

(5) *Operational characteristics (computed at standard conditions at sea level).*



Figure 4. Air Force C-7 Caribou.

- | | |
|---|---|
| <p>(a) Maximum gross weight: 28,500 pounds.</p> <p>(b) Operating weight: 19,475 pounds.</p> <p>(c) Fuel capacity: 4,968 pounds.</p> <p>(d) Allowable cargo load (maximum fuel aboard): 4,057 pounds.</p> <p>(e) Allowable cargo load (50-nautical-mile radius): 7,500 pounds.*</p> <p>(f) Allowable cargo load (100-nautical-mile radius): 7,500 pounds.*</p> | <p>(g) Allowable cargo load (200-nautical-mile radius): 7,000 pounds.</p> <p>(h) Cruising speed: 150 knots.</p> <p>(i) Fuel consumption per hour (computed at maximum gross weight at sea level): 660 pounds.</p> |
|---|---|

* Allowable cargo load is the same for 50- and 100-nautical-mile radius since this aircraft has a 27,000 pound zero fuel weight (weight of aircraft before fuel is added will not exceed 27,000 pounds).

Section IV. DEFENSIVE OPERATIONS

11. Defense of Unit Position

a. General. The commander of an Army air transport unit is responsible for the establishment of adequate defensive measures at the unit operating site. When two or more units are located at the same site, the senior commander is responsible. Normally, air transport units are provided with additional security forces to maintain a perimeter defense for the

protection of the aircraft and the operating site. Additional security forces are necessary for several reasons—

- (1) Air transport units cannot adequately defend themselves while authorized TOE personnel are operating and maintaining aircraft on a sustained basis.
- (2) Air transport units normally occupy

a large area at an operating site because of the number of authorized transport aircraft and the necessity for dispersion.

- (3) Transport aircraft provide an enemy force with a lucrative target and are prime subjects for attack and destruction.

b. Passive Defense. Passive defense includes measures taken to reduce the probability of and to minimize the effects of damage caused by hostile action without the expectation of taking the initiative. Army air transport units may implement passive defense measures by dispersion, cover, concealment, and deception. Aircraft may be parked inside revetments that are dispersed throughout the operational site. Maximum use of natural terrain features such as hills and wooded areas may provide cover and concealment of personnel and aircraft and to other unit equipment. Aircraft and other easily identified objects may be camouflaged with paint that will provide minimum contrast with surrounding terrain. Other passive defense measures may include the use of listening posts, barbed wire, mines and explosives, and electronic warning devices.

c. Active Defense. Active defense includes the employment of limited offensive action to repulse an enemy attack upon a position. Army air transport units are limited in their capability for active defense and must depend upon supporting security forces for protection against enemy air and ground threats. Commanders of Army air transport units must insure that organic weapons are used in active defense against hostile aircraft in accordance with guidance stated in paragraph 12.

12. Employment of Non-Air Defense Weapons Against Hostile Aircraft

a. General. It is necessary for commanders, supervisors, and users of non-air defense weapons to recognize the capability of organic small arms and automatic weapons to deliver large volumes of fire against low-flying hostile aircraft. The employment of non-air defense weapons should be considered in relation to the following precepts:

- (1) Recognize the threat of enemy air-

mobile operations, enemy close air support, interdiction, and reconnaissance aircraft against any unit in a combat theater.

- (2) Recognize the potential effect of a large volume of small arms fire that can be furnished by organic weapons against low-flying hostile aircraft.
- (3) Reflect the necessity of commanders' establishing detailed SOP for the identification and engagement of hostile aircraft to include how identification is accomplished, which personnel will fire, techniques of fire to be used, rules of engagement, and controls to be exercised.
- (4) Reflect the necessity for training individual soldiers in aircraft identification, techniques of firing at aerial targets, and response to control methods.
- (5) Emphasize the aggressive engagement of hostile aircraft with organic weapons as specified in carefully prepared SOP and rules of engagement.
- (6) Recognize the threat to friendly aircraft in failure to discriminate between hostile and friendly aircraft.
- (7) Place in proper perspective the tactic of withholding fire to preclude disclosure of positions.

b. Concept.

- (1) The substantial low-altitude threat faced by units in the combat theater may be partially countered by aggressive use of the large volume of fire which non-air defense weapons can place against this threat.
- (2) Exercise of the individual and collective right of self-defense against hostile aircraft must be emphasized. Hostile aircraft include all attacking aircraft and those positively identified enemy aircraft which pose a threat to the unit. Large volumes of fire from non-air defense weapons have proven capable of destroying both high- and low-speed aircraft or disrupting their attack. Exercise of this right does not

demand specialized use of communications and is independent of theater air defense rules for engagement and air defense control procedures.

- (3) Indiscriminate use of non-air defense weapons must be prevented because of the danger to friendly aircraft and troops and of the requirement to place in proper perspective the technique of withholding fire to preclude disclosure of positions. Effective and safe employment of these weapons necessitates Army-wide training.
- (4) Situations may arise in which the exercise of the right of self-defense should be temporarily suppressed or in which freer use of non-air defense weapons against aircraft should be encouraged. The former case involves a local decision that prevention of position disclosure is paramount. Notice of such restriction is disseminated through command channels. The latter case should be based on a theater-level decision.
- (5) Use of a single rule for engagement: "Engage hostile aircraft," is based on a common sense interpretation. For example, all aircraft attacking the unit and enemy aircraft performing operations such as forward air control, reconnaissance, surveillance, or dropping or landing troops are clearly hostile aircraft.

c. Rule for Engagement. In the absence of orders to the contrary, individual weapon operators will engage attacking aircraft; engagement of all other hostile aircraft will be on order issued through the unit chain of command and will be supervised by unit leaders. Nothing in this rule is to be taken as requiring

actions prejudicial to accomplishment of the primary mission of the unit.

d. Techniques. The techniques below should minimize the destructive and/or deterrent effect against aircraft. Aircraft may be divided into two categories—low-speed and high-speed. Low-speed aircraft include helicopters and liaison, reconnaissance, and observation fixed-wing propeller aircraft. High-speed aircraft include all other propeller aircraft and all jet fixed-wing aircraft. This distinction will result in simplified engagement procedures.

- (1) *Engagement of low-speed aircraft.* In accordance with the rule of engagement, engage low-speed enemy aircraft with aimed fire, employing the maximum weapon rate of fire. Aerial gunnery techniques (less lead) generally applicable to all small arms and automatic weapons are presented in FM 23-65.
- (2) *Engagement of high-speed aircraft.* In accordance with the rule of engagement, engage high-speed enemy aircraft with maximum fire aimed well in front of the aircraft, above its flight path, in order to force it to fly through a pattern of fire. This technique is not unaimed barrage fire, but requires a degree of aimed fire. It does not, however, call for careful estimation of aircraft speed and required lead.
- (3) *Use of tracer ammunition.* Automatic weapons should utilize the highest practical proportion of tracer ammunition to enhance the deterrent or disruptive effect.
- (4) *Massed fire.* Units should employ a massed fire technique when using small arms and automatic weapons in an air defense role.

CHAPTER 2

ORGANIZATION

Section I. GENERAL

13. Basic Organization

a. General.

- (1) The basic units of the Army air transport organization are the aviation medium and heavy helicopter companies. Air transport companies are organized as separate companies capable of operating independently in the field. An aviation battalion headquarters is provided to give centralized command and control. The battalion may be tailored by attachment of aviation medium helicopter companies and an aviation heavy helicopter company as required. The usual composition of the aviation battalion is described in paragraph 15. The headquarters and headquarters company of the battalion provides command, control, staff planning, and administrative supervision for three to seven aviation companies. Further centralization of command is achieved through the employment of an aviation group headquarters to control three to seven aviation battalions. Organization of the aviation group is discussed in paragraph 14. The aviation group is a major subordinate element of the transportation brigade in a field army support command (FASCOM). The aviation group may also be organized as part of the Army component of a subordinate unified command or a military assistance command. This organization provides the flexibility of command that is necessary for successful completion of combat service support operations.
- (2) Tables of organization and equipment

(TOE) applicable to Army air transport units provide three strength levels. Level one is the same as the former TOE full strength. Levels two and three are successive 10 percent reductions of personnel and possibly of equipment. An organization may operate under modified TOE (MTOE) when authorized by the appropriate major commander. Additional support from TOE-500 series forces may be necessary when air transport units are occupying semi-permanent base camps during internal defense operations. Such additional support may consist of base security forces, installation repair and utility personnel, POL storage and handling specialists, and water point operators.

- (3) The organization of Army air transport units is functional. Functions common to all units, regardless of size, are therefore reflected by similar subdivisions. Each unit consists of a headquarters element, which includes personnel who control or assist in the control of the unit and who provide administrative, supply, and service support; a maintenance element, which provides organizational maintenance services; and appropriate task elements, which form the major part of the organization. The basic characteristics of these elements and the primary duties and responsibilities normally assigned to key personnel are outlined in *b* through *d* below. Variations may be made at the discretion of the commander, within limits prescribed by higher

authority, to effect optimum utilization of personnel for the accomplishment of his assigned missions in a specific situation. The command prerogative must be preserved to the greatest practicable extent at all levels to maintain operational flexibility.

b. Headquarters Element. The size of the headquarters element and the allocation of duties and responsibilities to its authorized personnel vary with the complexity of the unit and the variety of its normally assigned tasks. The unit headquarters is normally divided into a command group (for control) and a service group (for administration, supply, and service support). At battalion or higher level, the headquarters element is a headquarters and headquarters company or detachment. At this level, a staff is provided to assist the commander. Duties and responsibilities of staff personnel are based on the functions of command (FM 101-5). The headquarters of the aviation companies, though not subdivided by TOE, also contain a command group and a service group. A brief description follows:

(1) *Command group.* The primary responsibility of the company commander is the successful accomplishment of the unit's assigned mission under all conditions (garrison or combat). This includes responsibility for training, discipline, control, administration, and welfare of assigned personnel and for security, maintenance, and proper utilization of all authorized equipment. The operations officer, first sergeant, and communications chief form the company command group to assist the commander in discharging these responsibilities.

(2) *Service group.* The service group of the company headquarters provides for the company supply and mess. Major duties of the service group are performed by the supply sergeant and the mess steward.

c. Maintenance Element.

(1) Effective aircraft maintenance is a key prerequisite of successful operation. The maintenance responsibility

is therefore one which no commander can afford to neglect. The company commander personally insures effective maintenance by emphasis on maintenance in individual and unit training programs, by inspection of equipment, and by provision of a realistic organizational maintenance program. The capability of the company is dependent on aircraft availability and normally increases in proportion to the effectiveness of organizational maintenance. The size of the maintenance element, type and amount of equipment, and personnel skill levels are determined by the type and amount of task equipment authorized and assigned by the appropriate TOE.

(2) Every member of the maintenance platoon or section must be proficient in his MOS. The leader of the maintenance element is a rated commissioned officer qualified as an aircraft maintenance officer. He is the adviser to and functional representative of the company commander in all maintenance matters. Since he directs and supervises all activities of the maintenance element, he must be an efficient manager. He plans maintenance operations, provides for emergency repairs, and plans the arrangement of tools and equipment to provide efficient service and repairs. He is responsible for the preparation of forms, records, and reports showing the status of organizational maintenance. He insures the adequate supply and authorized stockage of maintenance items and repair parts through timely requisition and constant control. He assists the commander in planning the unit maintenance program and in preparing the maintenance portion of the unit standing operating procedure (SOP).

d. Task Element. The task elements of the Army air transport company are its operating platoons. The platoons are purely operational and have no organic administrative, supply, or maintenance personnel; when operating in-

dependently over extended periods, such personnel may be attached. The commander of each platoon is a command representative of the company commander at platoon level. He is responsible to the company commander for training, guidance, and supervision of his platoon in compliance with company policies, orders, and directives. Platoon commanders

are assigned additional company duties to broaden their knowledge and to assist the company commander. These duties normally are rotated among the company junior officers and include such assignments as mess officer, supply officer, motor officer, security officer, administrative officer, and other assignments of a temporary nature.

Section II. COMMAND UNITS

14. Headquarters and Headquarters Company, Aviation Group

a. Mission. The aviation group, through assigned and attached subordinate units, provides air transport for combat service support and combat support operations. The headquarters and headquarters company (TOE 1-252) provides command, control, staff planning, and administrative supervision for the aviation group.

b. Assignment. The headquarters and headquarters company, aviation group, is normally assigned to the transportation brigade of the field army support command (FASCOM). It can also be assigned to a field army, a separate corps, a task force or the Army component of a subordinate unified or military assistance command.

c. Capabilities. At full strength, this unit is capable of providing—

- (1) Command, staff planning, and supervision of the activities of three to seven separate aviation battalions.
- (2) Site selection of the general area for subordinate units.
- (3) Supervision of maintenance and logistical functions of attached Army units.
- (4) Planning and supervision of the group communications system.

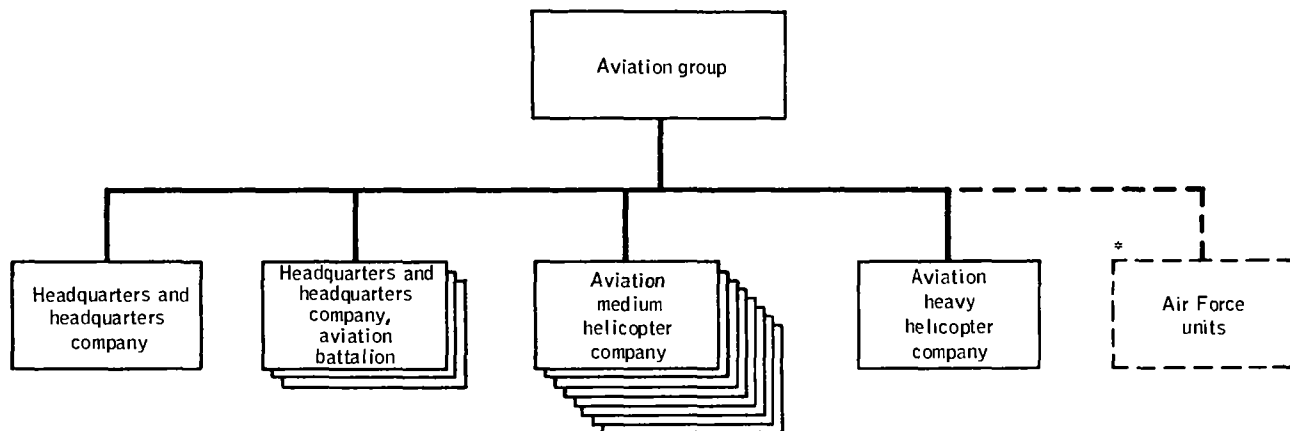
d. Limitations. The unit has the following limitations:

- (1) It is not adaptable to a type B organization.
- (2) It is 65 percent mobile in organic transportation and is dependent on

other sources of transportation when displacing.

- (3) It has a limited defense capability against hostile ground and air attack.
- (4) External communications are provided primarily by the area communications system.

e. Organization. The aviation group (fig. 5) is a major subordinate element of the transportation brigade of a FASCOM. For planning purposes, when supporting a 12-division force, an aviation group would normally include a headquarters and headquarters company; three headquarters and headquarters companies, aviation battalions; eight aviation medium helicopter companies, and one aviation heavy helicopter company. In addition, certain U.S. Air Force units may be attached as necessary. Such attachment would be in accordance with guidance contained in the Army-Air Force agreement of 6 April 1966. The pooling of air transport operational units under the centralized control of an aviation group provides maximum utilization of airlift resources and maximum responsiveness to the commander's requirements. The operational elements are tailored into battalions as required by specific mission requirements. The headquarters and headquarters company, aviation group (fig. 6), consists of a group headquarters and headquarters company. The group headquarters consists of the group commander and his staff. The headquarters company contains a company headquarters, an administration section, an operations and intelligence section, a maintenance and supply section, and a communications section.



*May be attached in accordance with guidance contained in CSA and CSAF agreement of 6 April 1966 (Appendix D).

Figure 5. Aviation group.

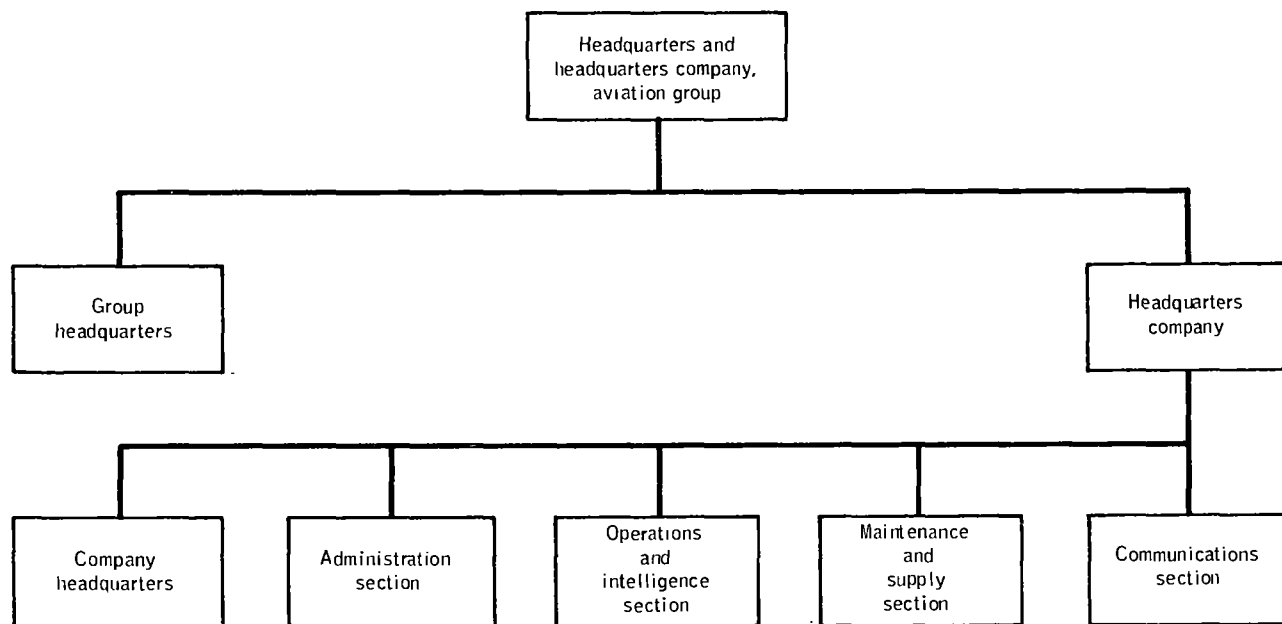


Figure 6. Headquarters and headquarters company, aviation group.

(1) *Group headquarters.* The group headquarters provides command, staff planning, and control of operations of assigned and attached aviation battalions. The group headquarters contains the group commander, executive officer, aviation medical officer, aviation safety officer,

chaplains, adjutant (S1), intelligence officer (S2), operations officer (S3), logistics officer (S4), communications officer, and sergeant major. Vehicular and aircraft transportation for group headquarters personnel is located in various staff sections of the group.

(2) *Headquarters company.*

(a) *Company headquarters.* The company headquarters provides personnel for command, motor maintenance, company administration, mess, unit supply, and other functions normally found in a company headquarters.

(b) *Administration section.* The administration section provides the personnel to support the administrative requirements of the group headquarters. It acts on official correspondence, prepares outgoing administrative directives, and authenticates and distributes all directives. In addition, it supervises preparation and maintenance of records, rosters, and reports concerning personnel matters.

(c) *Operations and intelligence section.* The operations and intelligence section provides the personnel required to assist the S2 and the S3 in the performance of their duties. Sufficient personnel have been provided to operate on a 24-hour basis. The section formulates plans, policies, and procedures for the group commander on operations and training. The section makes studies and prepares estimates of tactical situations, prepares operations orders, executes reconnaissance as directed, and plans measures for the security of the group area. The section provides, plans, and coordinates the assignment of operational tasks to subordinate units and maintains statistical records of subordinate unit operations. It collects and coordinates information concerning the number and type of units required to accomplish assigned support missions. The section provides pertinent intelligence data in support of air transport operations. Rated personnel in the section operate the three observation helicopters authorized the company, which are located in the maintenance and sup-

ply section. The section establishes and conducts training in methods and techniques of CBR (chemical, biological, and radiological) warfare.

(d) *Maintenance and supply section.* The maintenance and supply section provides maintenance and supply services for the group headquarters and the headquarters company. This includes the organizational maintenance for the three observation helicopters authorized the unit. This section provides officers and enlisted personnel to assist the group commander and staff in supporting maintenance and supply requirements of the group and its subordinate units. The maintenance and supply section contains the aircraft maintenance officer and sufficient aircraft enlisted technical inspectors to supervise and inspect the aircraft maintenance of the group.

(e) *Communications section.* The communications section installs, operates, and maintains the wire and radio communication nets for the group headquarters and provides the necessary control and supervision of communication procedures of attached units. The section contains the communications chief and all wire and radio personnel of the aviation group headquarters. The area communications system is the primary means of communication between the headquarters and attached units. Available radio facilities provide an alternate means of communications. The communications center of the headquarters is mounted in a $\frac{3}{4}$ -ton truck, enabling the unit to maintain a high degree of mobility. This truck contains sufficient equipment to receive and transmit on the group command net (FM) and the radioteleypewriter net (AM) and to monitor the air warning net.

f. Concept of Employment.

- (1) The aviation group allocates aircraft units and assigns missions to aviation battalions. Allocation of aircraft is based on the type of mission and the requirements established by higher headquarters. Aircraft operational units normally are allocated in accordance with aircraft characteristics and most efficient employment. The heavy demand for the use of the airlift capability of the aviation group makes centralized control essential when the group is providing airlift for combat service support operations. The aviation group receives daily logistic airlift requirements based on priorities established by the appropriate support commander. These requirements are processed at the FASCOM movement control center and are forwarded to the aviation group in accordance with established movement procedures. To insure maximum utilization of available aircraft, the aviation group provides the movement control center with current and forecast status reports of air transport capability. The aviation group maintains continuous coordination with the movement control center either by providing a liaison officer or by establishing an efficient reporting system. When elements of the aviation group are required to support combat support operations, the task units usually operate under the control of the appropriate tactical commander for the length of the specific mission.
- (2) The aviation group is capable of independent operations. However, where only token U. S. forces are present and normal combat service support troops and area logistical support points are limited or nonexistent, additional support must be planned for and provided concurrently with the deployment of the aviation group. The additional support includes the means to provide all classes of supply,

water points, medical facilities, engineer support, and other services not readily available from indigenous sources.

- (3) The headquarters and headquarters company provides command, control, and administrative supervision of the attached subordinate units. These units are located in areas where the greatest demands for their services originate. The aviation group headquarters does not have the capability to operate an airfield and usually locates itself within the vicinity of an attached task unit. A minimum number of aircraft are organic to the headquarters and headquarters company, aviation group, to permit rapid coordination with subordinate units, inspection of areas of operation, and other liaison missions that may be required.

15. Headquarters and Headquarters Company, Aviation Battalion

a. Mission. The aviation battalion, through assigned or attached aviation companies, provides air transport of personnel and cargo for combat service support and combat support operations. The headquarters and headquarters company provides command, control, staff planning, and administrative supervision for assigned or attached companies.

b. Assignment. The headquarters and headquarters company, aviation battalion, may be assigned to an aviation group when providing air transport for a support command. It may also be assigned to a field army, a separate corps, a task force, or the Army component of a subordinate unified or military assistance command.

c. Capabilities. The unit has the following capabilities:

- (1) At full strength it is capable of commanding and supervising the employment of three to seven transport aircraft companies.
- (2) It provides staff supervision and command guidance for organizational maintenance and logistical functions of assigned or attached Army units.

- (3) It provides medical service, including emergency medical treatment, operation of aid station, evacuation of sick and injured, and supervision of sanitation. It assists in the supervision of medical training of nonmedical personnel.
- (4) This unit can be adapted to operate with reduced personnel and equipment during prolonged noncombat periods or for limited periods of combat.

d. Limitations. The unit has the following limitations:

- (1) The battalion is not adaptable to a type B organization.
- (2) The headquarters and headquarters company is authorized only those wheeled vehicles that are required for day-to-day operations. Because the unit has only 50-percent mobility for

movement and displacement, aerial or vehicular transportation must be furnished either from assigned or attached aviation companies or from supporting units.

- (3) The unit has a limited defense capability against hostile ground and air attack.

- (4) External communications are provided primarily by the area communications system.

e. Organization. The headquarters and headquarters company, aviation battalion (fig. 7), is organized with a battalion headquarters and a headquarters company. The headquarters company consists of a company headquarters, a personnel and administration section, an operations and intelligence section, a communications section, a medical section, and a maintenance and supply section. Details of the organization are contained in TOE 1-256.

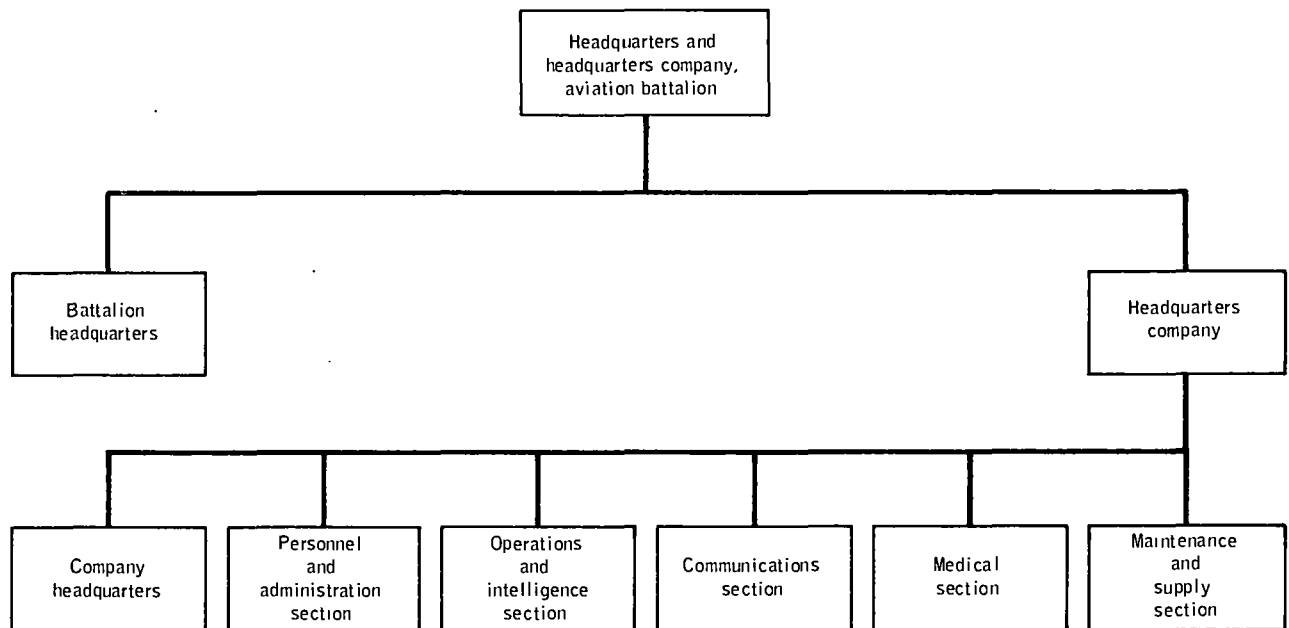


Figure 7. Headquarters and headquarters company, aviation battalion.

- (1) *Battalion headquarters.* The battalion headquarters is organized to function as the command and control headquarters for the employment of all assigned or attached aviation units. The battalion headquarters consists

of the battalion commander, executive officer, battalion staff officers, and battalion sergeant major. Two liaison officers are provided to maintain liaison with supported or attached units. These liaison officers, who are rated

Army aviators, must have a thorough knowledge of the operating capabilities and limitations of the aircraft, must be able to interpret and evaluate terrain features suitable for the selection of loading and unloading sites, and must be able to interpret and evaluate the effects of weather and other variables on the successful accomplishment of the mission. Command vehicle transportation, communications, and other mission items of equipment for the battalion commander and staff are located in the personnel and administration section. Aircraft support for necessary command and control is provided by three observation helicopters located in the battalion maintenance and supply section.

(2) *Headquarters company.*

- (a) *Company headquarters.* The company headquarters provides administrative service for the battalion headquarters and headquarters company. These services pertain to individual requirements of assigned personnel, including mess, supply, quarters, supervision of nonduty-hour activities, and maintenance of administrative records. The company headquarters contains the company commander, first sergeant, supply sergeant, mess steward, and other enlisted personnel required to accomplish the mission.
- (b) *Personnel and administration section.* The personnel and administration section prepares and maintains personnel records, rosters, correspondence, and reports pertaining to personnel matters of the battalion, thus relieving assigned or attached companies from as much paperwork as possible. The personnel assigned to this section are employed in the battalion headquarters and work under the supervision of the battalion adjutant.
- (c) *Operations and intelligence section.*

The operations and intelligence section assists the S2 and S3 in the organization, training, operations and intelligence functions of the battalion headquarters. Sufficient personnel are provided to maintain 24-hour sustained operations in both the operational and intelligence functional areas. This section assists in the planning and coordination necessary for the employment of assigned or attached aviation companies. Missions are received from higher headquarters by this section and scheduled and coordinated with the aviation companies. Status and availability of subordinate units are maintained to insure that current operational data are provided to higher headquarters. The operations and intelligence section is the center of activity within the battalion, and the successful employment of attached or assigned aviation companies is dependent upon the planning and coordination performed here. The section consists of the assistant S3 and sufficient enlisted personnel to perform the mission.

- (d) *Communications section.* The communications section consists of the communications chief, radioteletype team chief, and sufficient radioteletypewriter and teletypewriter operators, switchboard operators, and wiremen to provide the battalion headquarters with the required communications operational capability. A radio mechanic is authorized to perform organizational maintenance on organic radio equipment, and two message clerks operate the battalion message center. A detailed discussion of communications in an aviation battalion is included in FM 1-15.
- (e) *Medical section.* The medical section furnishes emergency medical treatment, operates a battalion aid

station, evacuates patients from dispersed elements of the battalion to the battalion aid station, and provides medical supervision of sanitation within the battalion. The medical section contains the section sergeant and sufficient medical specialists to perform its mission.

- (f) *Maintenance and supply section.* This section consists of the aviation maintenance officer, a unit supply technician, an automotive maintenance technician, and sufficient enlisted personnel to perform assigned functions. The section provides staff planning and supervision of the maintenance and supply functions of the battalion and coordinates the maintenance and supply functions of attached units. Personnel in this section accomplish organizational maintenance on the three observation helicopters authorized the unit.

f. Concept of Employment.

- (1) The headquarters and headquarters company, aviation battalion, is organized to provide command, control, and administrative supervision for three to seven assigned and attached companies. There is no fixed or typical type aviation battalion structure. The organizational structure of the aviation battalion is dependent upon the tactical situation, the type of mission to be performed, the distance to be flown, and the terrain where the mission is to take place.
- (2) The aviation battalion normally is employed directly under the control of

the aviation group when providing combat service support. However, when the aviation battalion is called upon to provide combat support, it is usually more advantageous to assign the unit to a field army, a separate corps, or a task force, depending upon the tactical situation. When the aviation battalion is employed in combat support, it operates under the control of the appropriate tactical commander for the length of time necessary to complete a specific mission.

- (3) Scheduled combat service support operations originating in a support command area normally will be repetitive in nature, and the aviation battalion will be able to accurately determine the type of subordinate units needed to sustain the operation over a prolonged period of time. In such a situation, the organizational structure of the aviation battalion can be stabilized. It is desirable for the aviation battalion to retain centralized control of the subordinate aviation units when supporting scheduled combat service support operations.
- (4) The aviation battalion headquarters normally will be established near a landing area of one of its subordinate aviation companies. Because the aviation battalion must be capable of supporting both combat service support and combat support operations, it must maintain a constant state of readiness. Coordination with supported units will reduce the time needed to prepare for specific missions and will aid in insuring successful employment of the aviation battalion.

Section III. OPERATIONAL UNITS

16. Aviation Medium Helicopter Company

a. Mission. The mission of the aviation medium helicopter company is to provide air transport of personnel and cargo for combat service support and combat support operations. This mission includes but is not limited to—

- (1) Movement of personnel and cargo along air lines of communication.
- (2) Supplemental aeromedical evacuation.
- (3) Air movement of reserve forces in preparation for combat operations.
- (4) Rapid displacement of rear area security forces.

b. Assignment. The aviation medium helicopter company may be assigned to a field army, a separate corps, a task force, or the Army component of a subordinate unified command or a military assistance command when providing air transport for combat service support and combat support operations. It normally will be attached to an aviation group or battalion of a support command when the primary function is to provide combat service support.

c. Capabilities. At full strength, the company has the following capabilities:

- (1) Operation of one heliport with facilities for visual and instrument terminal air traffic control.
- (2) Transport of personnel and cargo in day and night operations and during periods of inclement weather.
- (3) Aerial resupply of forces in the combat zone.
- (4) Transport of nuclear weapons and associated equipment and dangerous cargo. Air movement of cargo falling within these categories must comply with existing regulations and directives.
- (5) Augmentation of Army Medical Service aeromedical evacuation elements.
- (6) Transport of one of the following loads or a combination thereof in one lift as a maximum effort using all 16 CH-47A transport helicopters of the company and operating within a radius of 100 nautical miles at sea level and under standard day conditions: 528 troops, or 94 tons of cargo, or 384 litter cases and 48 ambulatory cases. For sustained operations, these capabilities are reduced and adjusted by aircraft availability and by operational considerations explained in paragraph 9.
- (7) This company is 100 percent mobile using organic vehicles and aircraft.

d. Limitations. The company has the following limitations:

- (1) It is not adaptable to a type B organization.
- (2) The effectiveness of the company is

reduced during periods of darkness or during inclement weather conditions.

(3) The company's capability is reduced by any one or a combination of the following factors:

- (a) Provision of personnel for an organic security force.
- (b) Periods of maximum effort (continuous 24-hour operations).
- (c) Reduction in or loss of personnel.
- (d) Loss of and reduced availability of operational transport helicopters.

e. Organization. The aviation medium helicopter company (fig. 8) is organized with a company headquarters, an operations platoon, two helicopter platoons, and a service platoon. Details of the organization are contained in TOE 1-258.

- (1) *Company headquarters.* The company headquarters provides command and administration for the company and supervision of operations, maintenance, supply, and training. The company headquarters contains the company commander, first sergeant, mess steward, supply sergeant, and sufficient personnel to perform the administrative and mess functions of the company.
- (2) *Operations platoon.* The operations platoon contains a platoon headquarters, a communications section, and an aviation control section. The operations platoon provides the personnel to establish and operate the heliport; to install, maintain, and assist in the operation of communication and navigational equipment utilized at the heliport; and to provide terminal approach control.
 - (a) *Platoon headquarters.* The operations platoon headquarters is the center of the company's activities, and its organization and efficiency determines the degree of success of the unit in supporting assigned missions. It includes a flight operations officer, who is responsible for the overall operations of the platoon to include coordination of flight mis-

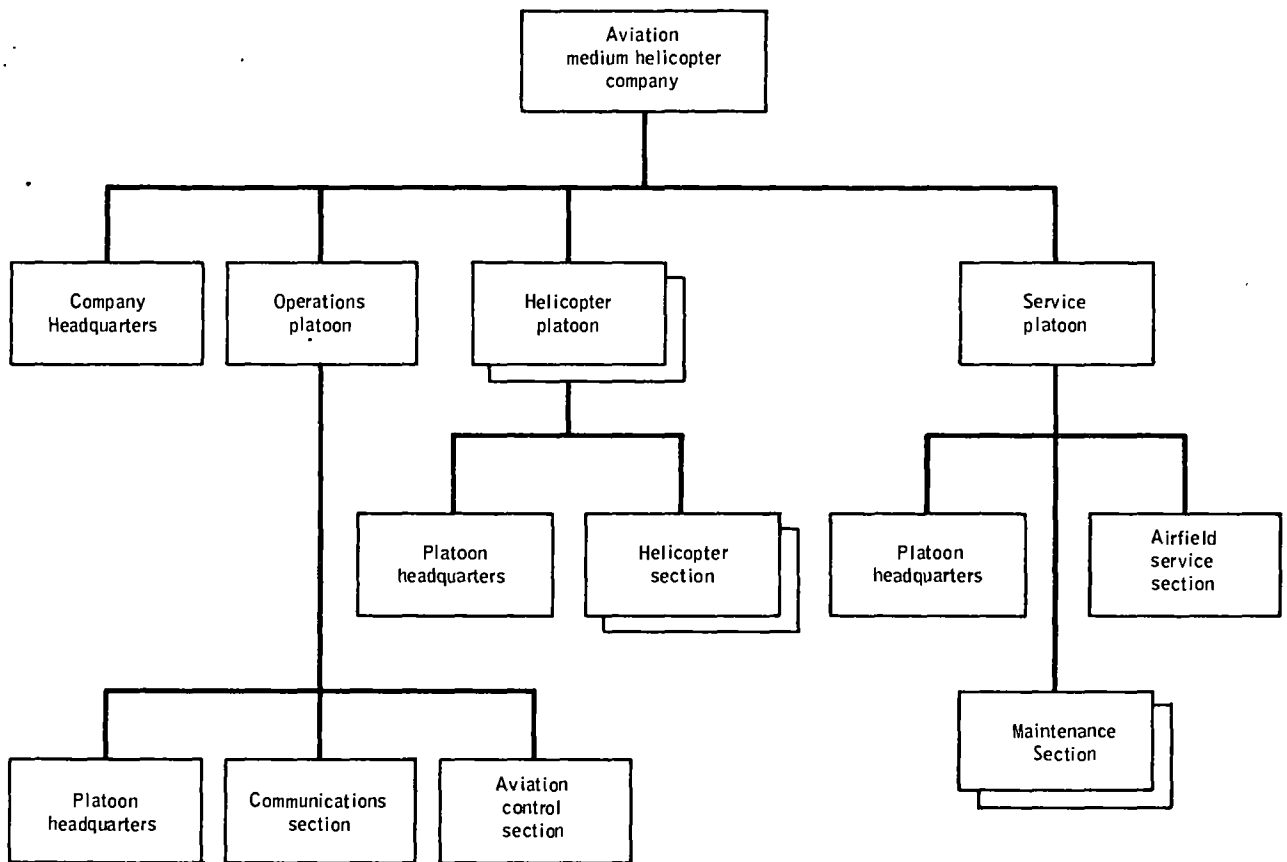


Figure 8. Aviation medium helicopter company.

sions, air traffic control, and airfield services. He is also responsible for processing requests for aircraft and assigning flight missions to the helicopter platoons in such a manner as to insure most efficient utilization of all assigned helicopters and flight personnel. An NCO flight operations chief, with sufficient enlisted personnel to operate on a 24-hour basis, supervises the installation, operation, and maintenance of the airfield operations center; assists aviation personnel in the preparation of flight plans; posts operations maps and charts; and files the latest flight, airfield, and weather information. Two crew chiefs are provided for organizational maintenance of the two observation helicopters assigned to the company.

A clerk-typist is provided to type operations orders and reports and to maintain the records of personnel in flight status.

- (b) *Communications section.* The communications section supervises and participates in the establishment, operation, and maintenance of the communication system of the company. This section contains the communications chief, GCA equipment repairman, radioteletype-writer team chief, and sufficient enlisted personnel to accomplish the mission. Refer to FM 1-5 for wire and radio diagrams of the company communications net.
- (c) *Aviation control section.* The aviation control section provides terminal traffic control at the base heli-

port during day, night, and inclement weather operations. The aviation control section contains the senior control tower operator, senior landing control operator, control tower operator, and landing control operator.

- (3) *Helicopter platoon.* Each helicopter platoon contains a platoon headquarters and two helicopter sections. The two helicopter platoons provide the air transport capability of the company.

(a) *Platoon headquarters.* The platoon headquarters is comprised of a platoon commander, a platoon sergeant, and a light truck driver. The platoon commander is responsible for the efficient operation of his platoon. He reports to the operations officer on the state of proficiency and training of the aviators. He assists the company commander and the operations officer in formulating plans for both routine and special missions involving his platoon.

(b) *Helicopter section.* Each helicopter section consists of a section commander, an assistant section commander, six rotary wing aviators, and four helicopter flight engineers. Each section is equipped with four CH-47A transport helicopters. The section commander is responsible to the platoon commander for the successful operation of the helicopter section. Section commanders insure that aviators performing missions are properly briefed on such aspects of operations as flight formation to be used, alternate plans, routes to be flown, weather, and communication frequency. Flight missions are assigned by the platoon commander or the section commander in coordination with the operations platoon headquarters.

- (4) *Service platoon.* The service platoon

consists of a platoon headquarters, two maintenance sections, and an airfield service section. The platoon provides organizational maintenance of organic helicopters, vehicles, and allied equipment and airfield service, to include crash and rescue service.

(a) *Platoon headquarters.* The platoon headquarters includes a platoon commander, helicopter repair technician, platoon sergeant, motor sergeant, helicopter technical inspectors, parts specialists, wheeled vehicle mechanics, and sufficient enlisted personnel to accomplish the mission. The platoon headquarters supervises, inspects, and provides administrative support for helicopter organizational maintenance. The platoon commander keeps the operations officer informed of aircraft availability and plans estimates of future aircraft availability. The platoon headquarters also provides personnel to perform organizational maintenance on assigned vehicles and allied equipment.

(b) *Maintenance section.* Each maintenance section consists of a maintenance supervisor and sufficient helicopter mechanics to accomplish the section's mission. The maintenance section performs organizational maintenance on assigned aircraft. It is desirable for the two maintenance sections to operate at the company heliport as an integral unit since this is a more efficient operation. However, each maintenance section is equipped so that it can accompany and support a helicopter platoon of eight CH-47A helicopters when detached from the company for a short period of time.

(c) *Airfield service section.* The airfield section consists of a section chief and sufficient personnel to provide ground crash and rescue service, refueling service, parking and

mooring service, and general assistance to helicopters utilizing the heliport.

f. Concept of Employment.

- (1) An aviation medium helicopter company may be employed as part of a support command transportation system for a field army, corps, or the Army component of a subordinate unified or military assistance command by providing airlift during combat service support operations. When the magnitude of the airlift requires the employment of several helicopter companies, command and control will be exercised through an aviation battalion. The appropriate tactical commander may direct that the aviation medium helicopter company may be used to provide combat support for the tactical forces. During such periods, the company will be under the operational control of the supported tactical unit for employment as needed.
- (2) Airlift missions performed by the aviation medium helicopter company normally will be accomplished within a radius of action of approximately 100 nautical miles and usually will be in areas where fixed wing landing strips are not available. The company receives daily missions from the aviation battalion for scheduled on unscheduled transport of personnel and cargo.
- (3) The aviation medium helicopter company can be employed in day and night operations and during periods of inclement weather. However, the effectiveness of the company is reduced during periods of darkness and during periods of inclement weather.
- (4) The aviation medium helicopter company is employed in support of airlift requirements, depending upon its capability. The company provides its higher headquarters, generally the aviation battalion, with a daily report of aircraft availability. When the company is being employed as part of

a support command transportation system, it is essential that a realistic availability factor be established and maintained so that commitments for the movement of personnel and cargo by airlift can be properly scheduled on a sustained basis. Aviation medium helicopter companies normally can provide 60 percent of assigned helicopters on a daily basis. However, this percentage may vary depending upon status of training, maintenance, parts support, geographical area of operations, and other factors that affect employment. The important point is that the company should attain an acceptable percentage of available helicopters and maintain that percentage on a daily basis so that its capability can be depended upon over an extended period of time.

- (5) When missions are received by the company, assigned personnel are designated as liaison officers. The purpose of the liaison officer is to effect prompt liaison with the unit to be supported to insure that adequate technical advice and assistance are provided. The liaison officer is the contact between the aviation medium helicopter company and the supported unit and plays an important role in insuring that the transport helicopters are properly employed in accordance with a reasonable degree of safety. Two observation helicopters are organic to the company for use in providing rapid transportation for the company personnel who are designated liaison officers. The contents of appendixes B through H should be brought to the attention of the supported unit.

17. Aviation Heavy Helicopter Company

a. Mission. The mission of the aviation heavy helicopter company is to provide airlift of heavy loads of cargo and to provide supplementary lift of personnel for combat service support and combat support operations. This mission includes but is not limited to—

- (1) Airlift of heavy items of equipment, supplies, vehicles, aircraft, weapons, command post vans, and forward surgical operating rooms.
- (2) Aerial evacuation of crashed and damaged aircraft.
- (3) Airlift of heavy cargo loads between supply activities.
- (4) Airlift of heavy cargo loads at transfer points between modes of transportation.
- (5) Supplemental aeromedical evacuation.

b. Assignment. The aviation heavy helicopter company may be assigned to a field army, a separate corps, a division, or to the Army component of a subordinate unified command or military assistance command when providing heavy airlift. Normally, when operating as part of a support command, the company will be attached to an aviation group or battalion.

c. Capabilities. At full strength, the company has the following capabilities:

- (1) Necessary communications and terminal facilities for the operation of a company heliport.
- (2) Transport of heavy cargo loads and personnel during day, night, or limited visibility conditions.
- (3) Establishment of local air traffic control at loading and unloading areas.
- (4) Airlift of nuclear weapons and associated equipment and dangerous cargo. Air movement of cargo falling within these categories must comply with existing regulations and directives.
- (5) Aerial resupply of forces in the combat zone.
- (6) Augmentation of Army Medical Service aeromedical evacuation elements.
- (7) Transport of one of the following loads in one lift using the company's nine CH-54A heavy lift helicopters and operating within a radius of 10 nautical miles: 90 tons of cargo, or 612 troops, or 432 litter cases.
- (8) This company is 100 percent mobile using organic vehicles and helicopters.

d. Limitations. The company has the following limitations:

- (1) It is not adaptable to a type B organization.
- (2) The effectiveness of the company is reduced during periods of darkness or during inclement weather conditions.
- (3) The company's capability is reduced by any one or a combination of the following factors:
 - (a) Provision of personnel for an organic security force.
 - (b) Periods of maximum effort (continuous 24-hour operation).
 - (c) Reduction in or loss of personnel.
 - (d) Loss of and reduced availability of operational heavy lift helicopters.

e. Organization. The aviation heavy helicopter company (fig. 9) is organized with a company headquarters, a flight operations platoon, three heavy helicopter platoons, and a maintenance platoon. Details of the organization are contained in TOE 1-259.

- (1) *Company headquarters.* The company headquarters provides command and administration for the company and supervision of operations, maintenance, supply, and training. The company headquarters contains the company commander, first sergeant, mess steward, supply sergeant, motor sergeant, and sufficient enlisted personnel to perform administrative, vehicular maintenance, and mess functions of the company.
- (2) *Flight operations platoon.* The flight operations platoon contains a platoon headquarters, communications section, flight operations section, and airfield service section. The flight operations platoon provides the personnel to establish and operate the base heliport; to provide communication for the unit; to install, maintain, and assist in the operation of navigational equipment used at the heliport; to provide terminal approach control; and to provide airfield service to include crash and rescue.

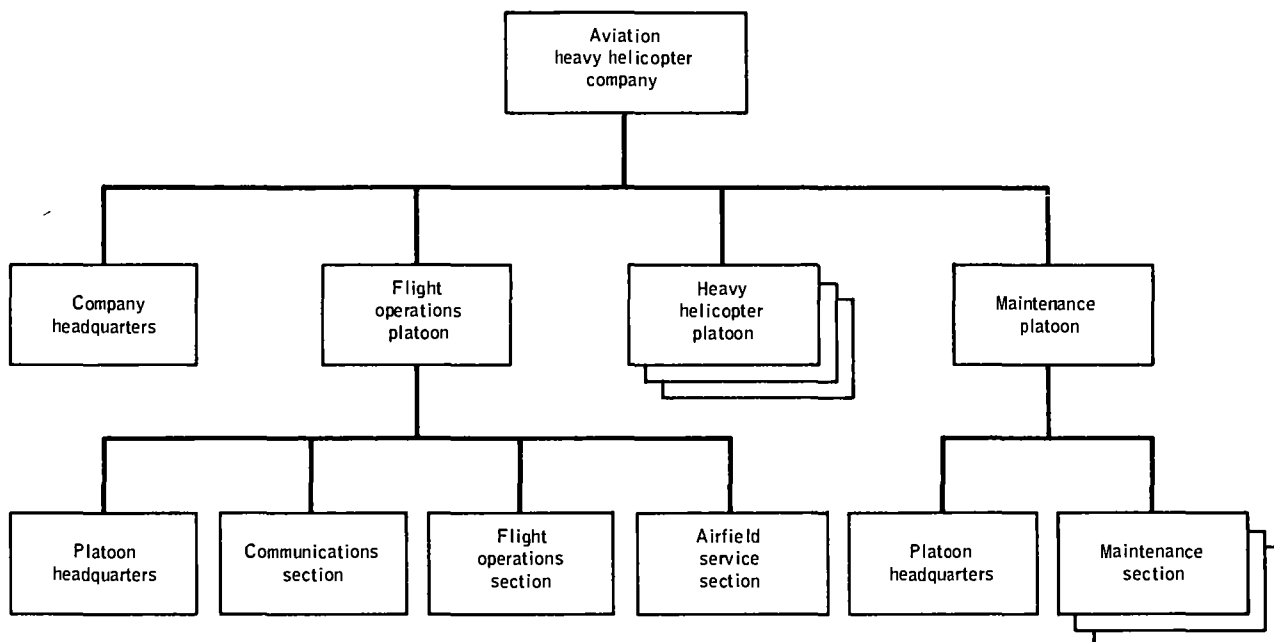


Figure 9. Aviation heavy helicopter company.

- (a) *Platoon headquarters.* The platoon headquarters includes a platoon commander who, with the assistance of a platoon sergeant and a clerk typist, supervises the activities of the communications section, the flight operations section, and the airfield service section. The platoon commander provides the company commander with a continuous appraisal of the operations and training of the company. He insures that proper coordination is affected between the flight operations platoon, the maintenance platoon, and the three heavy helicopter platoons in order to provide efficient airlift support for assigned missions.
- (b) *Communications section.* The communications section supervises the communications system of the unit and participates in the establishment, operation, and maintenance of the system. This section includes a communications chief and sufficient enlisted personnel to accomplish its mission.
- (c) *Flight operations section.* The flight operations section includes an air-

field operations officer, an enlisted flight operations chief, flight operations specialists, control tower operators, landing control operators, and a GCA (ground control approach) repairman. The airfield operations officer supervises the activities of the section and keeps the flight operations platoon commander continually informed of the operational status of the company. The flight operations section processes requests for helicopters and assigns flight missions to the heavy helicopter platoons of the company. Assignment of missions is contingent upon availability of helicopters and flight crews and is made in such a manner as to insure most efficient utilization of all assigned heavy lift helicopters and flight personnel. The section operates on a 24-hour basis and provides flight dispatch service to include scheduling, clearing, and dispatching helicopters; coordinating flight plans; assisting aviation personnel in the preparation and processing of flight clearances; posting operations

maps, charts, and flight information boards with the latest pertinent information; maintaining a current file of aircraft flying regulations and navigational information; and coordinating with the airfield service section concerning ground service requirements of assigned and transient helicopters. The section operates the company control tower and the GCA system; establishes and operates a local air traffic control zone, and monitors and controls all traffic arriving in and departing from the area.

- (d) *Airfield service section.* The airfield service section performs refueling of assigned and transient helicopters and provides ground crash rescue service. The section consists of an airfield service chief and sufficient enlisted personnel to accomplish the mission.
- (3) *Heavy helicopter platoon.* There are three heavy helicopter platoons in the company. Each platoon has three CH-54A heavy lift helicopters assigned to perform the airlift mission of the company. The platoon includes a platoon commander, nine helicopter pilots, three flight engineers, a platoon sergeant, and a general clerk. The number of rated aviators permits each heavy-lift helicopter to be operated with a pilot, a copilot, and a remote pilot aboard. The platoon commander is responsible for control, supervision, and efficient operation of his platoon. He assists the company commander and the flight operations platoon commander in formulating plans for missions involving his platoon. He coordinates with the airfield operations officer concerning the operational and training status of his platoon. The platoon commander insures that the aviators assigned to specific missions are properly briefed and that liaison is promptly established with the supported units. The platoon sergeant co-

ordinates the maintenance effort of the platoon with elements of the maintenance platoon and supervises and trains the enlisted personnel of the platoon.

- (4) *Maintenance platoon.* The maintenance platoon consists of a platoon headquarters and three maintenance sections. The platoon provides organizational maintenance and repair parts support to the organic heavy-lift helicopters.
- (a) *Platoon headquarters.* The platoon headquarters includes the platoon commander, platoon sergeant, technical inspectors, and sufficient enlisted personnel to accomplish the unit's mission. The platoon commander acts in the capacity of the company maintenance officer. He is responsible to the commander for aircraft organizational maintenance and for the training of maintenance and aircraft parts specialists. He advises the flight operations platoon on aircraft availability and makes estimates of future availability.
- (b) *Maintenance section.* There are three maintenance sections in the maintenance platoon. Each maintenance section contains a warrant officer aircraft maintenance technician, maintenance supervisor, assistant maintenance supervisor, and sufficient enlisted helicopter mechanics to accomplish the section's mission. Each maintenance section is organized and equipped to enable it to provide organizational maintenance for one heavy helicopter platoon. Most efficient utilization is obtained from the maintenance sections when they are operated as an integral unit, usually located at the base heliport.

f. Concept of Employment.

- (1) An aviation heavy helicopter company may be employed as part of a support command for a field army, a corps, or the Army component of a subordinate

unified command or military assistance command by providing airlift for heavy loads during combat service support operations. The aviation heavy helicopter company may also be employed in combat support operations. In such cases the company, or elements of the company, will be attached to the appropriate tactical unit for employment as needed.

- (2) The design and capability of the helicopters that are organic to the aviation heavy helicopter company make this unit more responsive for the airlift of heavy cargo load over short distances. It is intended that the company will be employed for the airlift of heavy equipment, supplies, vehicles, weapons, and aircraft. When equipped with a detachable pod, the helicopter of the company can provide supplemental air movement of troops and casualties. The capability of the company should not be dissipated in

supporting missions that can be accomplished by aviation medium helicopter companies.

- (3) The company provides its higher headquarters, generally the aviation battalion, with a daily report of aircraft availability. Mission assignments normally are received by the company on a daily basis. While the aviation heavy helicopter company is capable of providing support for scheduled airlift operations along air lines of communication, such employment is the exception rather than the norm. Typical operations employing helicopters of the aviation heavy helicopter company will be airlift of crashed or damaged aircraft to repair sites, airlift of heavy cargo loads between supply activities, airlift of heavy cargo and equipment across terrain barriers, and airlift of heavy cargo loads at transfer points between modes of transportation.

CHAPTER 3

COMBAT SERVICE SUPPORT OPERATIONS

Section I. ARMY AIR TRANSPORT SERVICES

18. General

Modern developments in weaponry, together with the potential threat of nuclear attack, have led to greater dispersion of combat and supporting units in the combat zone. Also, the need to operate at widely separated geographical locations and under varied environmental conditions has generated a demand for increased mobility within the Army forces and has placed a high premium on an effective military transportation system. Air mobility within the Army is provided by the assignment of an organic airlift capability to certain Army units; for example, one airmobile company in each ROAD infantry and airborne division and an aviation group in the field army support command (FASCOM) transportation system. The airmobile units that are organic to certain Army organizations, such as the airmobile company of the division, are primarily employed in combat support operations. This subject is covered in detail in FM 1-15, and FM 57-35. The aviation group and its attached units, when assigned to a FASCOM, or other support command, are primarily employed in combat service support operations. Today's battlefield logistical requirements demand a transportation system that is capable of providing sustained support at a speed commensurate with the mobility of the combat forces. This high degree of mobility can only be attained when the logistical support commander has sufficient air transport units assigned on a continuing basis.

19. Employment

Army air transport provides the field commander with highly mobile, rapid air movement that is capable of bypassing terrain barriers and manmade obstacles. These advantages

enable aviation units to be employed in combat service support operations that cover a broad spectrum of situations.

a. Figure 10 depicts the employment of air transport units providing air movement from a logistical base to a division and to brigades that are operating in an underdeveloped area. Similar airlift is provided by Army air transport units when supporting forces are engaged in an insurgency operational environment. This type of employment is characterized by the movement of personnel and cargo over extended distances, usually over pockets of resistance or insurgent controlled or dominated territory, with delivery being accomplished as far forward as practical. Aircraft make daily deliveries to the combat forces, normally to airstrips and landing sites located within the division and brigade area. However, when feasible, loads may be delivered directly to subordinate units operating away from their base area. Maximum use will be made of scheduled deliveries, particularly of class I, III, and V supplies, to reduce the days of supply required in the forward area. In an environment of this type, the air transport units will probably provide all the logistical transportation required to support the combat forces.

b. Figure 11 depicts the FASCOM air transport units providing combat service support to a type field army of 3 corps and 12 divisions. Ideally, the aviation group and its attached units provide airlift of personnel and cargo from various pickup points in FASCOM to points as far forward as practical without the necessity of making transfer to another means of transportation. Combat service support air movements generally originate from loading sites located at or within the vicinity of Army terminals, Air Force terminals, general sup-

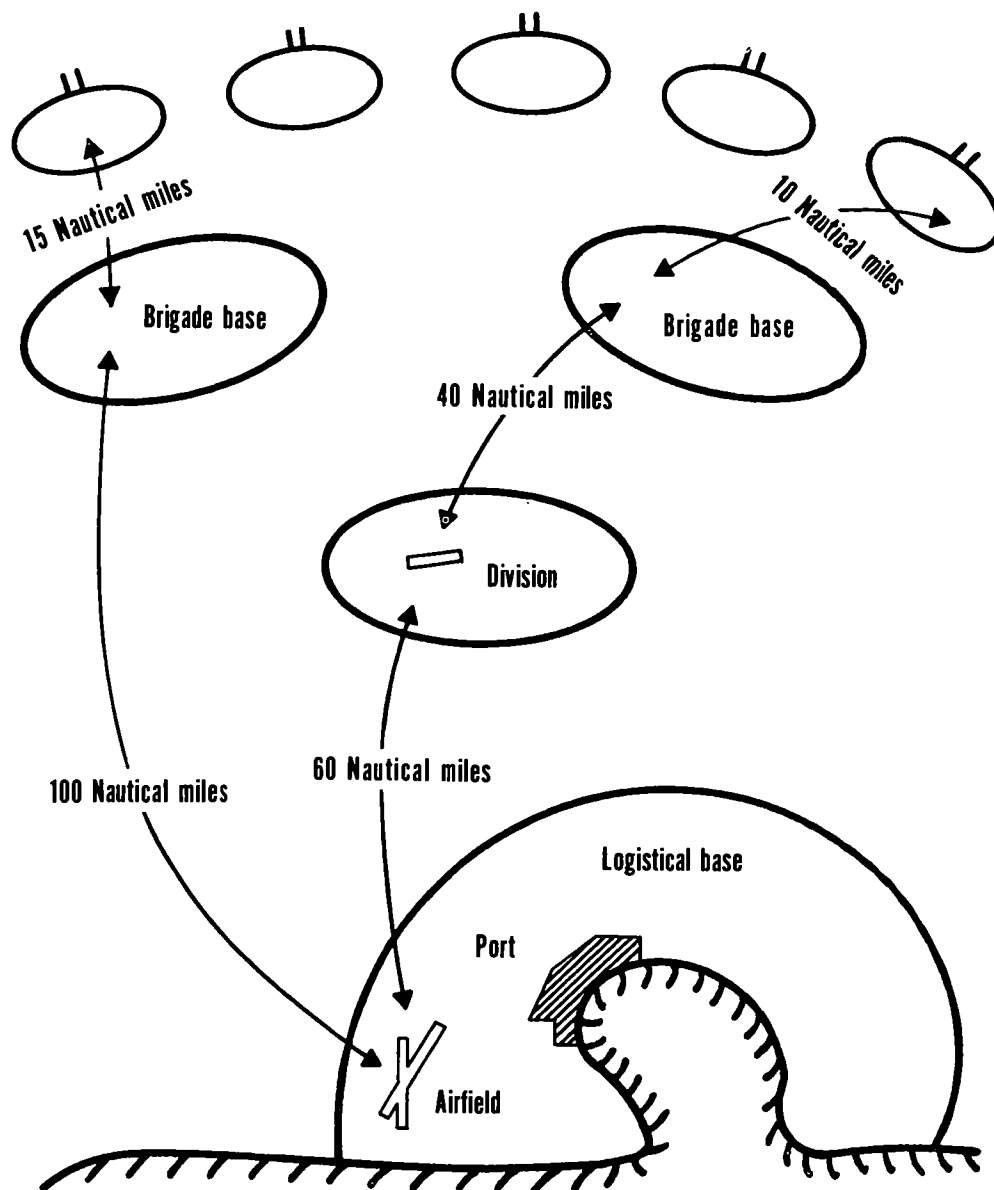


Figure 10. Air movement from a logistical base to a combat force operating in an undeveloped area.

port activities, transfer points, or replacement activities. Air transport units also provide airlift for lateral shipments when necessary; an example of a typical lateral shipment is an air movement between an Air Force terminal and a general support activity, both located within the FASCOM area.

c. In addition to the situations depicted in figures 10 and 11, Army air transport units support different mixes of combat forces operating under varied tactical situations. As

an example, elements of the aviation group may provide combat service support for a separate corps, brigade, or task force or for MAAG advisory detachments or special forces detachments.

20. Categories of Air Movements

Combat service support air movements are categorized as scheduled or nonscheduled.

a. Scheduled air movements constitute the routine air transport service that is operated

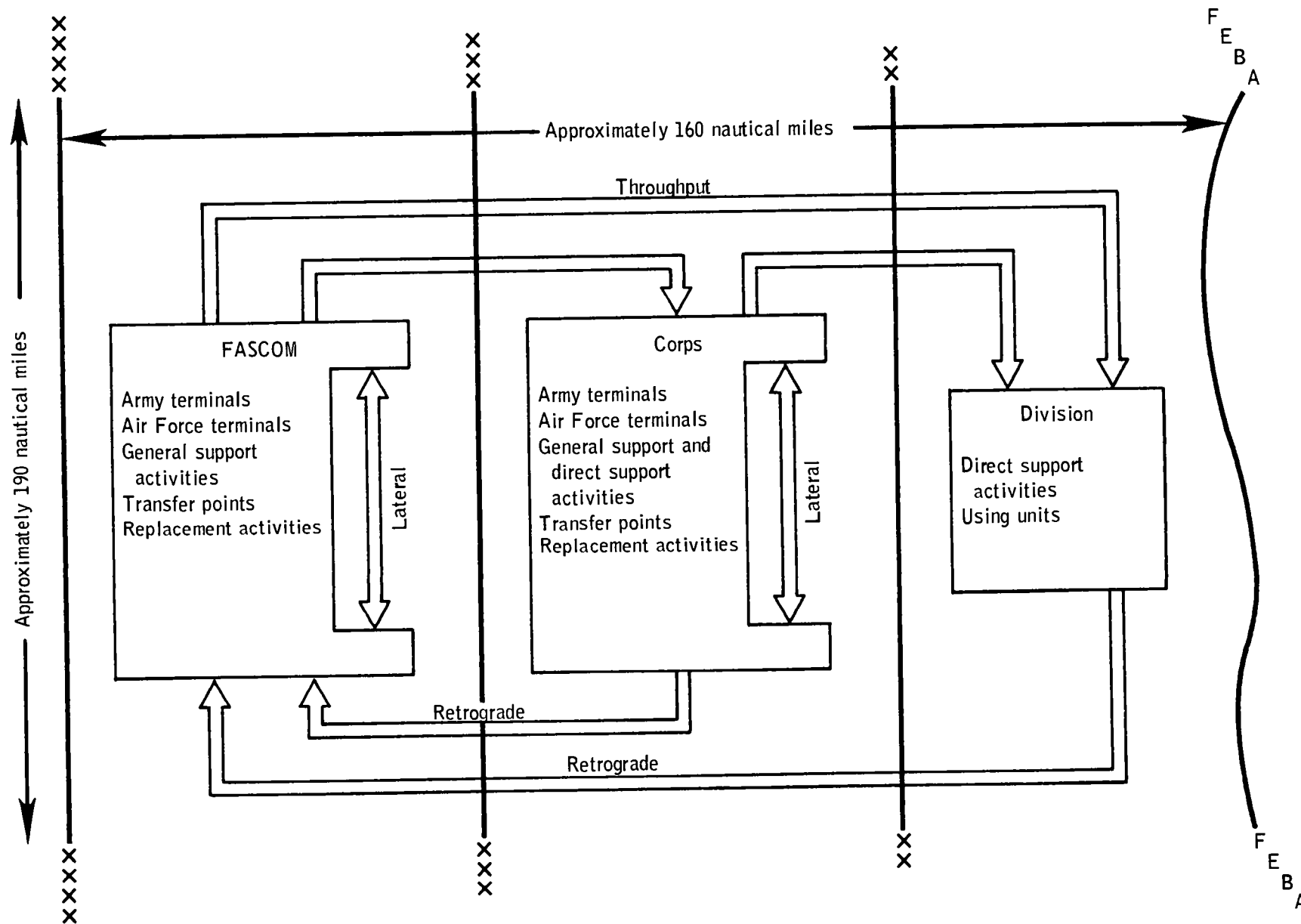


Figure 11. Air movement by FASCOM air transport in support of a type field army.

in support of planned or programed requirements. It is most desirable from the standpoint of efficient utilization to scheduled air movements since requirements can then be precisely matched to the airlift capability of the Army air transport units. The allocation of airlift to support scheduled air movements is based on priorities established by the appropriate logistical support commander and is processed through a movement control center. For details of transportation movements services, refer to FM 55-10. Scheduled air movements generally are, but not always, performed over Army air lines of communication (LOC). Air LOC are explained in detail in paragraphs 21 through 25. When Army transport aircraft are supporting scheduled air movements into forward areas, caution should be exercised that flights are not established to arrive and depart each day at a particular operating site according to a timetable. The repetitive arrival and departure of an aircraft at fixed times can alert an enemy or an insurgent tactical force and make the flight vulnerable to attack.

b. Nonscheduled air movements are generated by daily actions that cannot be determined in advance and therefore cannot be acted upon in sufficient time to be included in a movements program or plan. Unexpected requirements for resupply movements, movement of additional replacements, or a diversion of other modes of transportation are typical situations that generate nonscheduled air movements. Although the optimum situation would be to have all transportation requests scheduled in advance, such a condition is not realistic. In fact, an inherent characteristic of nonscheduled movements is that such requirements increase as the combat service support effort moves toward the division area. Nonscheduled air movements are processed through a movement control center and are coordinated by the center and its field offices with the appropriate aviation unit. Priorities for nonscheduled air movements are established by the logistical support commander. Nonscheduled air movements may or may not be performed over Army Air lines of communications.

Section II. ARMY AIR LINES OF COMMUNICATION

21. Concept

a. It is necessary that the Army's transportation system be organized and employed to keep pace with the mobility requirements of the combat forces. Under certain conditions, this will require Army air transport to operate over Army air lines of communication (LOC). Air LOC connect an operating military force with a base of operations. The primary difference between ground and air lines of communication is that Air LOC utilize aircraft as the means of movement along the route.

b. Air movement of cargo and personnel throughout a theater of operations by Air Force intratheater airlift will be exploited to the maximum consistent with the tactical situation, availability of suitable landing areas, and the ability of recipients to receive the quantity of cargo delivered. Army-operated Air LOC will be established as an integral part of the Army's combat service support to the combat forces. Army Air LOC are particularly suitable to scheduled air movements.

c. Army Air LOC are under the operational control of the Army. Basically Army Air LOC can be divided into two separate functioning areas—the terminal area, which includes departure and destination bases, and the interconnecting area or the air route between the terminal areas. Points of departure and destination vary widely in description and capacity, ranging from relatively sophisticated air terminals to rudimentary landing sites.

d. Air Force terminals located within the logistical base or field army area and used by Air Force aircraft as terminals for intertheater Air LOC will be controlled by the Air Force. The Army may also use Air Force controlled terminal facilities in the field army area.

e. Army terminals will be developed at advantageous geographical locations to move tonnage forward to support units, supply points, and division or brigade bases of operation. Airfields in the division area are under the operational control of the division commander.

f. Air LOC include an air transport element,

which may be an aviation group, battalion, or company; terminal elements; and necessary movements management personnel. In addition, other supporting elements are attached as necessary to meet the requirements of the force supported.

g. The key to successful Air LOC operations is the coordination and timing developed among aviation units, shippers, receivers, and terminal personnel. This coordination is generally provided by a movement control center and its subordinate transportation movement offices. The transportation movement control center is responsible for insuring that available transportation resources are used in the most efficient manner to support airlift requirements in the priority established by the appropriate commander. The center provides the planning necessary to balance the airlift capability provided by the air transport units against the requirements of the supported units. In Air LOC operations, transportation movement offices are responsible for maintaining a continuous and orderly flow of traffic into and out of the airlift system. This includes both scheduled and nonscheduled air movements.

h. Army aviation medium helicopter units provide efficient air movement of personnel and cargo when operating along Air LOC within a 100-nautical-mile radius. Aerial transport support requirements for a division will vary from none to 100 percent of the daily tonnage factor. Air LOC supporting an airmobile division should be capable of handling the division's total daily tonnage on a sustained basis. To maintain the flexibility and responsiveness of an airlift system supporting an airmobile division, it may be necessary to relocate existing terminals and to establish new terminal sites commensurate with a frequently changing tactical situation. Aircraft generally make daily deliveries from a supporting logistical command or field army support command (FAS-COM) to a division base and in some instances to each brigade base of operations in furtherance of the throughput concept. For a detailed explanation of throughput, refer to FM 55-10.

22. General Responsibilities

a. Air Force. The theater air force commander is responsible for all terminal opera-

tions in support of theater Air Force air lines of communication. The Army may assist in the operation of Air Force air terminals in accordance with local agreements. For detailed information concerning local agreements, see AR 59-106.

b. Army.

- (1) The theater army commander is responsible for the operation of Army Air LOC. Air LOC operations are a part of the theater transportation service.
- (2) The appropriate logistical support commander is responsible for furnishing combat service support to the combat forces. An essential part of this responsibility is the conduct of Air LOC operations.

23. Aviation Unit Operations

a. General. Rapid and dependable air movement along Army Air LOC is achieved only when close coordination and efficient working arrangements exist between the aviation units and other elements involved in the operation. Aviation units employed in Air LOC operations are responsible for providing the airlift to support scheduled and nonscheduled air movements between departure and destination bases. In addition, these units normally provide airfield operation support at Army air terminals.

b. Commander's Responsibilities. The senior Army air transport commander (aviation group, battalion, or company) is responsible to the appropriate logistical support commander for the efficient employment of aviation units engaged in Air LOC operations. In addition, he has the following responsibilities:

- (1) Supervises and controls the operations of subordinate aviation units.
- (2) Establishes policies for Air LOC flight operations.
- (3) Coordinates with other headquarters or commands concerning the technical aspects of Air LOC operations.
- (4) Insures compliance with policies, directives, and regulations affecting flight operations along air routes and corridors.

c. Organization. The type of air transport organization committed to provide combat ser-

vice support along Army Air LOC is influenced by the tactical situation and the logistical support requirements to be airlifted. Aviation units described in chapter 2 are used to provide the necessary airlift.

d. Employment. The employment of aviation units in Air LOC operations is directly affected by the following factors: commodity to be airlifted, quantity involved, distance between loading and unloading sites, and whether or not there is to be a recurring airlift requirement. The senior air transport commander determines, on the basis of an analysis of these factors, the most suitable composition of aviation units and where they should be located to provide the most effective Air LOC support.

e. Operational Considerations. The following factors influence the airlift operations of air transport units providing Air LOC support:

- (1) *Type, weight, and cube of cargo.* The characteristics of the cargo and the quantity to be airlifted are determining factors in the type and number of aircraft required. Helicopters can be used to provide external lift for out-size cargo.
- (2) *Location of loading and unloading sites.* Maximum effectiveness in Air LOC operations is obtained when loading and unloading sites are located as close as practical to the shipper and the receiver. Factors to be considered in site locations are relative freedom from obstacles; nearness to dominating terrain; good road nets; cover and concealment, particularly at forward landing sites; and ease of identification from the air.
- (3) *Pickup and delivery times.* Effective Air LOC operations are dependent on precise timing and prompt support by participating units. Timing affects aircraft flights during normal operations performed along a monitored air route in accordance with a planned flight schedule. During ground operations, timing affects aircraft utilization because the time taken to load and unload constitutes a segment of the total turnaround time for each

aircraft mission. Normally, pickup and delivery during daylight permit more cargo and personnel movement than can be accomplished at night.

- (4) *Airfield service.* Broadly stated, the more extensive the ALOC operation, the greater the amount of airfield service needed by the air transport units. Airfield service must be promptly provided in order that aircraft can operate in accordance with established flight schedules.
- (5) *Air traffic control procedures and navigational aids.* Army Air LOC operations provide airlift on an around-the-clock basis and during inclement weather. When Air LOC movements extend from a logistical base or FASCOM into the forward areas of the divisions or corps, aircraft normally operate along air routes or corridors that are controlled and monitored through the Army air traffic regulation system. Air LOC operations are closely tied into the Army air traffic regulation system because normally each individual flight is dependent on information provided through this system. A detailed explanation of the operational procedures of the regulation system is provided in paragraph 24.

24. Army Air Traffic Regulation System

a. The air space over the combat zone is used by all participating services in furtherance of their missions. This includes the use of aircraft, both fixed and rotary wing; missiles; drones; and artillery. The joint force commander must establish measures for preventing interference in the operations of all services to insure efficient employment and safety and to provide identification between friendly and hostile configurations operating in the air space.

b. The Army component commander establishes an Army air traffic regulation system as a part of the overall air space regulation system. This system provides a means of handling aircraft traffic operating in the air space that is designated as the responsibility of the Army. The height or altitude and the extent of the air

space is determined by Army-Air Force joint agreement and approved by the joint force commander. Broadly stated, lower altitudes within the air space over the combat zone will normally be used by low-speed traffic and will be controlled by the Army. The Army air traffic regulation system is established and coordinated by an aviation air traffic control company under the staff supervision of the field army aviation officer. The company is capable of regulating air traffic under instrument flight rules, establishing navigational aids, providing air warning, and furnishing other assistance to in-flight aircraft such as weather advisories and pertinent air route information. The aviation air traffic control company and its organic elements provide this service throughout the field army area.

c. Air routes are established to facilitate and control the passage of aircraft between two points, usually between major terminal areas and Army airfield locations. Air traffic control facilities are installed as dictated by aircraft density rather than by tactical boundaries. Air routes or corridors will extend as far forward as the division instrumented airfield. This provides an all-weather capability as far forward as the division base. For operations where an airmobile division requires continuous combat service support airlift or where a division operating in an undeveloped area requires sustained logistical airlift, the division commander may extend Army air traffic regulation support farther forward by installation of instrumented airfields at brigade bases.

d. Under visual flight rules, aircraft are operated in accordance with the clearance and control procedures prescribed by their respective component commanders within the overall policies established by the joint force commander. These aircraft may use established air routes or corridors or may fly direct from one point to another. The aviation air traffic control company can furnish such assistance as navigational aids, flight route information, weather information, and air warning service.

e. For further details of the Army air traffic regulation system, refer to FM 1-60.

25. Army Air Terminals

a. *General.* Army air terminals are a part

of Air LOC operations. An air terminal is more than an airfield or a departure and destination base along an Air LOC. An air terminal is an installation provided with the facilities for loading and unloading aircraft and for in-transit handling of personnel and cargo. Terminals are located near Air Force bases, Army supply points, replacement activities, and supported units. Specific locations are determined through coordination among the commands concerned. Terminals are established where cargo and personnel airlift requirements exist and are relocated as the tactical situation changes and units are displaced.

b. Organization.

- (1) Army air terminals vary greatly in size, appearance, organization, complexity, and physical features. Existing airfields, airstrips, and aircraft operating sites will be used whenever possible. A minimum of construction will be performed. For this reason, there is no such a thing as a typical Army air terminal.
- (2) Facilities at the air terminal may include a landing strip, parking area, fuel storage area, crash rescue equipment, staging area, medical facilities, temporary cargo holding area, terminal service area, and maintenance area.
- (3) The organizational structure of each Army air terminal is dependent on the magnitude of operations performed at the particular installation. Supporting units vary from groups, battalions, or companies down to platoons or elements of a unit. Sufficient units and personnel are provided to perform the following functions: airfield operations and aircraft support, terminal support operations, and movements management. Army air terminals located within a logistical base, FASCOM, or corps normally are manned with personnel from Army air transport units, terminal transfer companies, a movement control center, and required additional support elements. Air terminals located within

a division area are normally organized and staffed with units and personnel organic to the division. However, additional personnel may be attached as required.

c. Responsibilities. An air terminal commander will be designated by the commander (logistical base, field army, division) or his representative. The air terminal commander will normally be the senior officer at the installation. His staff is composed of representatives from units or elements assigned to the terminal to accomplish the various functions necessary in air terminal operations. The primary purpose of the staff is to coordinate the activities of the various units to insure orderly and efficient operations. Each commander of a unit or element at the terminal is responsible for the performance of his particular organization. The air terminal commander will designate a unit to be responsible for messing and billeting of personnel. However, if the size of the force required to operate the terminal exceeds the normal support capability of assigned units, the area commander may provide housekeeping forces to perform administrative support.

d. Airfield Operations and Aircraft Support.

- (1) Normally, airfield operations and aircraft support at Army air terminals located within a logistical base or field army are performed by Army air transport units. For this reason, it is advantageous to position the aviation units at airfields, airstrips, or landing sites that are at or centrally located to supply activities and other users of Army transport airlift. At air terminals located within a division area, airfield operations and aircraft support are provided by personnel organic to division aviation units.
- (2) Airfield operations and aircraft support include the establishment and operation of the following:
 - (a) Airfield operations office.
 - (b) Control tower.
 - (c) Air traffic control.
 - (d) Air terminal guidance control.
 - (e) Aircraft parking facilities.

- (f) POL (petroleum, oil, and lubricants) facilities.
- (g) Fire and ground crash rescue service.
- (h) Transient aircraft service.
- (i) Maintenance.

e. Terminal Support Operations. Terminal support operations include those cargo handling functions that involve loading and unloading air and surface vehicles, temporary cargo holding, documentation, and selection and arrangement of cargo into loads. In a logistical base or FASCOM, these functions are performed by terminal transfer companies or elements of such units. Terminal transfer companies are assigned on the basis of the daily amount of tonnage moved through the terminal. FM 55-56 gives a comprehensive explanation of the organization and operations of a transportation terminal transfer company (TOE 55-118). At division level, the division support command is responsible for terminal support operations. Normally, these functions are performed by the supply and transport battalion, but elements of a terminal transfer company may be attached to provide assistance for limited periods of time. In order to obtain a rapid and orderly flow of traffic, terminal support elements must have the capability to clear an air terminal at a rate of speed equal to the rate of incoming traffic. In the handling of cargo, the ideal situation is a perfect balance in which cargo moves into and out of the terminal at the same speed. However, this seldom occurs and some facilities must be available to handle cargo that requires temporary holding. Situations that may require temporary holding at Army air terminals are as follows: unexpected redeployment of transport aircraft to a combat support role; adverse weather conditions resulting in cancellation of scheduled flights; inability of terminal support elements or forward support units to process the cargo at a pace suitable to a steady flow through the air terminal; and diversions of flights due to maintenance, weather, or enemy action.

f. Movements Management. A transportation movement office is located at an air terminal when operations are large enough to warrant a full-time office. Otherwise the

terminal will be serviced by a transportation movement office located in the vicinity. The transportation movement office coordinates and manages the flow of cargo and personnel into and out of Army air terminals. In addition, the transportation movement office serves as the point of contact between the transportation service and its users. In accomplishing these missions, transportation movement offices supporting air terminals perform the following duties:

- (1) Call personnel and cargo forward to meet regularly scheduled flights or nonscheduled airlift.
- (2) Assign air release numbers for cargo and personnel movements.
- (3) Arrange for the clearance of cargo and personnel from air terminals.
- (4) Insure that cargo moves in accordance with established priorities.
- (5) Maintain liaison with other elements performing air terminal functions and with consignors and consignees.
- (6) Verify that reports of shipment (REPSHIPS) are sent to destination transportation movement offices.

g. Additional Support Elements. The following support elements may be attached to an Army air terminal as required:

- (1) Air Force weather detachments to provide accurate, up-to-date flight weather conditions and other pertinent meteorological information.
- (2) Security forces and air defense elements to provide defense. Normally, these elements will be a part of the rear area security and area damage control forces.
- (3) Engineer elements for construction and repair of the airfield, storage areas, and facilities; area damage control; and augmentation for crash rescue operations.
- (4) Medical elements to provide the terminal with medical facilities, to serve as an area medical facility, and to support retrograde airlift by casualty evacuation flights. Also, teams RC and RD, TOE 8-500, helicopter ambulance air crash rescue detachments, of the medical brigade, FASCOM, to

furnish aeromedical air crash rescue service.

- (5) Signal elements to augment the avionics support of the airfield, to assist in the maintenance of the communications net, and to provide the terminal commander with technical advice on communication matters.
- (6) Transportation elements to furnish additional drayage capability, to participate in local or short haul operations, or to augment the lines of communication.

h. Documentation.

- (1) Cargo moving through air terminals is documented in accordance with DOD 4500.32-R. The basic document for all cargo movements under these procedures is the transportation control and movement document, a multi-purpose form which can be prepared manually or mechanically as a punch-card. The manual version of the form, DD 1384, is a seven-part document, which is originated by the shipper for each transportation unit and which accompanies the cargo to the ultimate consignee. As a general procedure, Army air transport units transporting cargo will be presented an envelope containing the proper documentation in sufficient copies to moves the cargo from origin to destination. The aircraft commander assumes responsibility for the documents. If the aircraft lands and discharges the cargo at an intermediate air terminal or airfield because of weather, mechanical difficulties, or a diversion in flight, the aircraft commander notifies the transportation movement office at the air terminal of origin that the shipment has been diverted and requests disposition instructions. Documentation accompanies the cargo to the air terminal or airfield of destination. When the cargo reaches destination, the documents are disposed of according to established procedures. In addition, a copy of the documentation is re-

turned to the air terminal of origin, where it is retained as a record of the completion of the shipment.

- (2) Personnel group movements are flight-manifested by replacement activities or staging area elements, unit personnel sections, or the combat units. Individual personnel movements are flight-manifested by the air transport operations personnel or aircraft crew members.

i. Throughput distribution. Throughput distribution, which refers to shipments that bypass intermediate supply installations, is used in air movements whenever possible. Transshipment may be required, particularly in a corps or division area, when incoming cargo may arrive at a destination base aboard fixed wing aircraft and then be transferred to helicopters for unit distribution. While some transshipment cannot be avoided, repackaging is minimized since supplies are palletized, containerized, and coded to conform to the needs of individual units. When unit distribution is accomplished by helicopter, cargo is normally air transported externally. For details of external air transport procedures refer to TM 55-450-8.

j. Security.

- (1) *General.* Defense requirements of Army air terminals will vary greatly in scope and will be governed by a number of factors which may vary daily. Some of these factors are as follows: proximity to the forward edge of the battle area, nature and types of terrain, enemy surveillance capability, fluidity of combat opera-

tions, degree of air superiority, size and importance of the terminal, degree of permanency of the terminal, and friendliness or hostility of the local civil populace.

- (2) *Local defense.* Local defense is primarily defense against ground attack from guerrilla forces and infiltrating enemy troops operating in rear areas and from insurgent tactical forces operating in an insurgency operational environment. Defense against any attack greater in scope than the foregoing cannot be provided by local defense measures. Combat units may be attached to an air terminal to increase local defense as required. Local security forces should be of sufficient strength to ward off any ground attack long enough to permit all aircraft to become airborne. This involves a 15- to 30-minute period after receipt of the warning. During this time, the attacking force must be kept 800 or more yards from the landing strip to minimize the effects of small arms fire and light mortars. Parked aircraft are particularly vulnerable to both. Defense measures must be planned in advance to meet various situations.

- (3) *Air defense.* The composition of an Army air terminal is such that the installation is normally only capable of passive air defense. Active air defense for the protection of air terminals must be provided by attached forces.

Section III. MOVEMENT CONTROL FOR AIRMOBILE LOGISTICS (SKYWATCH)

26. General

The material in this section is intended as an aid to better understanding of a movement control technique, known as Skywatch, developed to provide effective supply support for airmobile operations. Skywatch is applicable to aircraft engaged in supply support operations from a logistical base to an airmobile force. It is used primarily to support division units. However, the technique may be im-

plemented when larger size forces are employed in an airmobile operation.

27. Changing Situations

a. Any operating military force must be connected with a base of operations by lines of communications along which supplies may move at a speed that will allow completion of the mission. When the operating military force is engaged in airmobile operations, the

requirements for speed, flexibility, and maneuverability necessitate that supplies move at a rate comparable to that of the operating force. These factors, coupled with the operating range of an airmobile force, require that resupply be accomplished primarily by aircraft.

b. Because of rapidly changing tactical conditions and the inherent characteristics of airmobile operations, problems of resupply are encountered that are peculiar to this type of operation. Airfields and landing sites are rapidly established where needed for the immediate tactical operation and, either by necessity or by prior plan, evacuated or abandoned as the situation dictates. Supplies en route to airfields or operating areas may arrive at the intended destination only to find the landing site no longer in operation but evacuated or fallen into enemy control. Also, a rapidly changing tactical situation may generate urgent demands from individual units for supplies that are aboard incoming aircraft but destined for other units.

c. It is necessary that aircraft operating from a logistical base and providing supply support to airmobile forces be capable of changing destination while in flight. When such a diversion of destination takes place, the cargo must be directed to a location where it can be effectively used. There is a requirement for a responsive and rapid system of control to insure timely arrival of supplies at the most appropriate place. To meet this requirement, the Skywatch technique has been developed.

28. Operation of Skywatch

a. Essentially, Skywatch controls the movements of incoming and outgoing aircraft that are providing combat service support airlift from a logistical base to an airmobile force. Skywatch is organized within the transportation section of a division support command and normally is located at the support command command post. Within an airmobile division, movements control specialists assigned to the transportation section staff the Skywatch element. These personnel are not authorized in the transportation section of other type army divisions and must be obtained from other sources when the division or its subordinate

units are employed as an airmobile force.

b. Skywatch personnel operate communication facilities and provide movement instructions to all aircraft performing combat service support airlift. Personnel also maintain flight operations charts that enable rapid identification of incoming and outgoing flights. The charts display a record of each aircraft by tail number, departure and arrival time, destination, and commodity aboard. Direct supervision of Skywatch is provided by the division transportation movements control officer who is located in the transportation section of the support command command post.

c. Skywatch radio facilities enable communications with the supporting logistical base, all major division and brigade airfields, and all incoming and outgoing aircraft. The logistical base commander insures that each aircraft providing combat service support en route to or departing from the airmobile force area contacts Skywatch via radio. Skywatch, knowing the current situation of each brigade base (via communications with the forward support operations officer in each committee brigade), diverts aircraft to any division location upon direction of the support command operations officer. Additional information is provided to Skywatch by the aircraft themselves. First, the aircraft are required to call in after departing the logistical base, identify their cargo by shipment number, and receive instructions. Then, as they approach the destination landing area and establish contact for landing instructions, they become the link capable of informing Skywatch of current, up-to-the-minute airfield intelligence. Skywatch expedites the evacuation of prisoners of war, patients, equipment, supplies, or empty containers by routing returning aircraft to airfields where pickup can be accomplished, and by arranging refueling, if necessary.

d. The basic supply information needed at the Skywatch element is the air movements requirements for each operating base in terms of class, type, and quantity of supplies. The support command operations officer in the support command command post provides necessary supply information to the transportation movements control officer, who is responsible for Skywatch. Cargo requirements are projected

at midnight for the following 24 hours and can be revised continually as the situation changes. Priorities may change frequently but, at any one period of time, they guide Skywatch in placing necessary supplies and equipment at the right place, in the correct amount, on time. By the use of Skywatch, supplies can begin landing at a new base within minutes after word is flashed that the base is capable of accepting traffic.

e. Additional considerations involved in Skywatch are as follows:

- (1) *Communications.* The supporting logistical base establishes and operates two closed radio-communications nets. One net provides communications between the movement control center of logistical base and the division transportation officer. The second closed net is used exclusively by the division support command operations officer and the supporting logistical base supply manager. Although the volume of traffic over each net precludes the elimination of either one, one net can be used for a limited time as a backup net when radio difficulties affect the other net. With the establishment of a closed net between movements personnel at the logistical base and division base, timely notification is received by the transportation section of supply flights scheduled to arrive in the division or brigade bases of operation.
- (2) *Reports of shipment.* The reports of shipment (REPSHIPS) serve as the principle transportation document to identify supplies being moved by the

aircraft. REPSHIPS are transmitted by the movement control center logistical base and are received by the division transportation officer through the teletypewriter located in the support command command post. A separate REPSHIP is transmitted for each aircraft departing from the logistical base for the division area and contains the following items of information: supply request number, type and quantity of supplies aboard each aircraft, tail number of the aircraft, and departure time. The supply request number and type of supplies aboard each aircraft are identified by established codes. Tail number of the aircraft and departure time are transmitted in the clear. The codes used minimize the amount of traffic over the communications net. The coded supply request number indicates the delivery area, date of the request, and the specific supply request by area (1st brigade area, 2d brigade area, etc.). The code used for supplies indicates not only the class of supply, such as petroleum, oil, and lubricating products (class III), but further defines the category within each class of supply (aviation gasoline, motor gasoline, etc.). All classes of supply, except class II and IV, are palletized or containerized and coded accordingly. The palletizing and containerizing of cargo and supplies to the fullest extent possible enables the division to apply the system of throughput distribution to maximum advantage.

CHAPTER 4

COMBAT SUPPORT OPERATIONS

29. General

a. Combat support is operational assistance furnished combat elements by other designated units. The Army air transport units discussed in chapter 2 provide combat support when directed to do so by the appropriate commander. This may be the commander of a field army, a corps, the Army component of a subordinate unified command, or a military assistance command. Airlift operations accomplished by these units when attached to a tactical force are considered to be combat support operations. Normally, the combat forces receive tactical airlift from aviation units that are organic to divisions and corps. Within each ROAD infantry and airborne division, an aviation battalion provides air transportation in support of division airlift requirements. It is only when the tactical situation demands additional airlift beyond the capability of the division and corps aviation units that aviation elements of a support command are called upon to provide combat support.

b. Army air transport units may be called upon to provide combat support airlift in the following typical situations: movement of units engaged in airmobile operations, shifting and relocation of forces within the combat zone, movement of reserves, and movement of units for rear area security and area damage control. The requirement for air transportation to support combat elements may be generated by—

- (1) A need for attaining tactical advantage.
- (2) A need for speed and flexibility.
- (3) Dispersion of units on a nuclear battlefield.
- (4) Inadequate surface routes as a result of enemy or insurgent interdiction or terrain obstacles.
- (5) Advance of tactical units or the iso-

lation of friendly forces beyond the capability of surface transportation.

30. Responsibilities and Relationships

a. When directed by the appropriate commander, air transport units that normally provide sustained airlift to a support command may be employed in combat support operations. The decision to divert either a portion or all of these air transport units for tactical airlift support must be weighed against the effect on the combat service support transportation airlift service that is operated on a continuous basis. During the time that the aviation units are providing combat support, the capability to provide combat service support is reduced in direct proportion to the number of units diverted. It is essential that the aviation units be returned to the control of the support command as soon as practical upon completion of the tactical operation.

b. Requests for tactical airlift are submitted by the combat forces to the appropriate command for approval and fulfillment. Requests originating within a division are coordinated by the division aviation officer and the G3. When division airlift requirements cannot be supported by organic division aviation units, the request is forwarded to the next higher headquarters, usually corps. Requests are submitted to the corps aviation officer for approval by the corps G3. Airlift requests that cannot be supported by either division or corps aviation units are forwarded to army, where they are coordinated by the army aviation officer and submitted to the army G3 for approval. Upon notification from the field army G3 of a commitment to provide combat support airlift, the field army support command aviation group commander determines the air transport units most suitable to support the tactical requirements.

c. The combat force that requests tactical airlift is responsible for planning the movement. The air transport unit that is designated to perform the airlift establishes liaison with the supported unit to assist in the movement planning. (See app B for a liaison officer's guide.) Aircraft used in combat support operations normally are provided on a mission basis, with the aviation unit integrity maintained as much as possible. The relationship between the air transport commander and the combat force commander depends upon the mission assignment status of the aviation unit. Aviation units are attached to, under the operational control of, or in support of the combat force. Refer to FM 1-15 and FM 57-35 for more detailed information on the relationship between the air transport unit and the combat force.

31. Employment

a. The composition of the air transport force employed in a combat support operation is directly influenced by the magnitude of the tactical airlift requirement. The participation of several air transport companies will require the employment of an aviation battalion to provide command and control of these units.

b. Upon receipt of a combat support mission, air transport company commanders supervise the preparation and dissemination of employment procedures to members of the unit. Employment procedures are developed in conformity with the operational plan prepared by the combat force commander. Air transport commanders, through their subordinate leaders, insure that flight personnel participating in the operation are properly briefed. Proper orientation minimizes confusion, reduces the risk of failure, and enables personnel to adjust rapidly to deviations from the original plan. Instructions to flight crews must be explicit and brief and will include the following:

- (1) Designation of flight leaders and the tactical unit(s) to be supported by each.
- (2) Composition of flight units to include number of aircraft, based upon the combat force commander's plan.
- (3) Location of loading and landing sites.
- (4) Flight routes and alternates.

- (5) En route flight formations, altitude, and flight speed.
- (6) Air traffic control and IFF (identification, friend or foe) procedures.
- (7) Intelligence, to include weather forecast.
- (8) Location of refueling sites and instructions for using these facilities.
- (9) Schedule for movement to the loading zone.

32. Types of Operations

Army air transport units may participate in various types of operations identified within such broad categories as offensive, defensive, retrograde, and special operations. Army air transport units also participate in internal defense operations in support of United States-host country forces.

a. *Offensive Operations.*

- (1) *Movement to contact.* Movement to contact is conducted preliminary to combat to place troops in position to close with the enemy. Army air transport units can provide necessary airlift to move combat forces over broad areas in the minimum of time and into positions that will assist the commander in obtaining a tactical advantage.
- (2) *Meeting engagement.* Tactical operations in undeveloped areas, in an insurgency operational environment and in locations where combat forces are widely dispersed are particularly vulnerable to meeting engagements. Such an engagement is a combat action that occurs when a moving force, incompletely deployed for battle, engages an enemy force unexpectedly. The ability of the combat commander to airlift necessary troops and equipment rapidly into a favorable tactical position provides him with a distinct advantage.
- (3) *Vertical envelopment.* In a vertical envelopment, the forces are airlifted into positions that permit an attack to the rear and flanks of the enemy with the intent of cutting off or encircling the opposing position. Vertical en-

velopment is desirable when attacking an organized enemy position that ground combat forces might find difficult to destroy by frontal assault. This type of maneuver permits the combat force commander to engage an enemy with troops that are still fresh and strong. It also provides the combat commander with the added effect of surprise and shock action.

- (4) *Penetration.* Penetration seeks to break through the enemy's defensive position, to widen the gap created, and to destroy the continuity of his position. The divided enemy forces are then destroyed, and mobile forces exploit the enemy rear positions. Air transport units can provide the airlift for the combat forces conducting operations to seize limited objectives, to seal off approach routes of enemy reserves, and to seize critical terrain on the flanks of the penetration.
- (5) *Infiltration and exfiltration.* Infiltration is the movement of small groups or individuals into an area at extended or irregular intervals. When used in connection with the enemy, it implies that contact is avoided. Exfiltration is the removal of personnel or units from areas under enemy control by stealth, reception, surprise, or clandestine means. Air transport units may be employed to support this type of operation by airlifting part or all of the participating force or by airdropping supplies and equipment.
- (6) *Exploitation and pursuit.* Exploitation is a phase of offensive action that usually follows a successful penetration or envelopment. It is characterized by rapid advances against lessening resistance. Pursuit is an offensive action against a retreating enemy force. It may consist entirely of direct pressure, or it may be a combination of direct pressure and encircling movements. Air transport units may be used in exploitation and pursuit roles to airlift supplies that are rapidly consumed; to provide aerial

movement of troops and equipment to key positions on the enemy's flank or rear; and to provide airlift to seize objectives in the enemy rear, cut lines of communication, block escape routes, and destroy an enemy rear guard.

b. Defensive Operations.

- (1) *Mobile defense.* Mobile defense relies on maneuver of combat forces with the retention of organization and firepower in an effort to seize the initiative from the enemy. In this type of operation, most of the defending force is held as a striking force, with the remainder manning the forward defense positions. The defender seeks to engage the enemy in decisive action at a time and place of the defender's choosing. The employment of Army air transport in a mobile defense provides the combat force commander with a tactical advantage. Airlifted troops enable the commander to shift forces at his choice of time and to positions that provide the most suitable area for engagement.
- (2) *Position defense.* In position defense, the defending forces are disposed in selected tactical areas. Principal reliance is placed on the ability of the combat forces in the defended areas to maintain their position and to control the terrain. Army air transport units may be called upon to support the combat forces in much the same manner as in mobile defense. However, a position defense usually requires less support from air transport units than does a mobile defense.
- (3) *Counterattack.* Counterattack is an operation by a part or all of a defending force against an enemy attacking force in order to regain lost ground or to cut off the enemy's advancing units. The availability of air transport units enables the defending combat force commander to rely more heavily on reserve troops located in dispersed areas and to cover more enemy avenues of approach.

c. Retrograde Operations. A retrograde operation is a movement of a force to the rear or away from the enemy. A retrograde movement may be forced by the enemy, or it may be made voluntarily. Such movement may be classified as a withdrawal, a retirement, or a delaying action.

- (1) *Withdrawal.* In a withdrawal, all or part of a deployed force disengages from the enemy. Air transport units can be used to speed up a withdrawal, giving the withdrawing units more time to organize their rearward positions. Air transport also make it easier to extricate covering forces.
- (2) *Retirement.* A retirement is an orderly withdrawal without pressure from the enemy. The use of air transport in this type of operation permits the movement of retiring forces to the rear to gain distance from the enemy.
- (3) *Delaying action.* Delaying actions are used when space is traded for time and maximum punishment is inflicted upon the enemy without being decisively involved in combat. Airlifted combat forces can take maximum advantage of delaying positions because they are not dependent upon adjacent road nets for maneuverability and escape.

d. Special Operations.

- (1) *Amphibious.* An amphibious operation is an attack launched from the sea involving a landing on a hostile shore. Army air transport units may be employed in both the assault and the general unloading phases of the ship-to-shore movement, as well as within the beachhead. Refer to FM 31-11 and FM 31-12 for details of amphibious operations and the employment of Army air transport.
- (2) *Chemical, biological, and radiological (CBR).* Army air transport units afford the ground commander the increased mobility and flexibility needed to conduct CBR operations. CBR material needed for such operations include weapons, devices, and agents, plus protective equipment. Army air

transport units may be called upon to provide the following type of support:

- (a) Transport of CBR material from dispersed supply points to combat forces for immediate employment.
- (b) Air movement of combat forces as a part of a CBR operation.
- (c) Airlift of protective equipment to critical areas.
- (d) Evacuation of forces from contaminated areas.
- (e) Conduct of CBR aerial surveys.

e. Internal Defense Operations. Internal defense is the full range of measures taken by a government and its allies to free and protect its society from subversion, lawlessness, and insurgency. Internal defense operations are conducted directly against armed insurgents and their underground organization, support system, external sanctuary, or outside supporting power. Army air transport units may be called on to participate in such operations by providing airlift of personnel and cargo and also to support other tasks associated with internal defense. Internal defense operations include airlift of U.S.-host country forces, equipment, and cargo; internal security; military civic action; advisory assistance; intelligence operations and psychological operations. Additional discussion of internal defense operations is in FM 31-16 and FM 31-22.

- (1) *Airlift of U. S.-host country forces, equipment, and cargo.* The major task of Army air transport units in supporting internal defense operations is to provide prompt airlift of U. S.-host country forces throughout the area of operations and to insure continuous resupply of these forces. The nature of insurgent forces and their tactical capabilities, including guerrilla and more sophisticated forms of warfare, coupled with poor road nets and rugged terrain, which are characteristic of insurgency operational environments, create mobility disadvantages for standard armed forces and place great reliance on movement by Army air transport. Some typical missions may include airlifting personnel and cargo from ship to shore in areas lack-

ing adequate harbor facilities or beaches, airlifting artillery or vehicles in support of ground or airmobile forces, and airlifting reserve forces to reinforce engaged troops or to block avenues of escape.

- (2) *Internal security.* Army air transport units may support U.S.-HC military forces and civilian agencies to maintain law and order and to control the movement of material and resources. Operations may include airlifting police and security forces on raids, cordon, and search, and border security into remote areas. Transport helicopters may be used during resettlement operations to airlift villages and refugee groups with their belongings to village complexes and designated secure areas.
- (3) *Military civic action.* Army air transport units may be utilized in support of military civic action programs by providing airlift of personnel and cargo into remote areas. Such operations may include air movement of construction equipment and building supplies, transporting civic action personnel (for example, medical, engineer, agricultural), providing air movement of disaster relief emergency support, and airlifting survey and mapping parties.
- (4) *Advisory assistance.* Individuals or elements of Army air transport units

may be employed to train and advise host country personnel. Advisory assistance teams may conduct schools and training centers to develop the HC capability for operating their own aircraft and accomplishing air transport operations. Air transport units transport and supply mobile training teams and civilian specialist teams providing advisory assistance in isolated areas.

- (5) *Intelligence operations.* Air crews provide one of the most valuable sources of intelligence data. Participation in airlift operations provides the crews with the opportunity of becoming intimately familiar with vast areas and the activities taking place within them, and changes in activity and/or terrain itself become recognizable. Unit intelligence officers maintain up-to-date intelligence situation maps depicting areas of insurgent activity, antiaircraft fire, landing zones, safe areas, and evasion and escape routes.
- (6) *Psychological operations.* Army air transport units may provide air movement for psychological operations personnel and equipment into remote or isolated areas. Examples of such support would be the airlift of radio vans, printing facilities, audio-visual units and entertainment teams.

CHAPTER 5

TRAINING

33. Responsibilities

a. General. The purpose of the Army training program is to develop and maintain a state of proficiency in both individuals and units that will insure the successful accomplishment of assigned missions. Training is accomplished on an individual, group, or unit basis. It may consist of training in service schools or unit, schools or on-the-job training. Training is a continuous process that must be conducted in such a manner that the efficiency of the unit when performing its normal operations will not be materially interrupted.

b. Aviation Group Commander. The aviation group commander is responsible for the establishment of master training schedules, technical training programs, and unit schools for subordinate air transport units. The aviation group actively supervises the training of all units in the group and coordinates with the transportation brigade to obtain required support. Suitable training areas are designated for subordinate units. The group headquarters effects the necessary planning, coordination, and liaison to provide combined training exercises between air transport units, tactical forces, and other support type units.

c. Air Transport Unit Commanders. Unit commanders are responsible for the training in their organization. Air transport battalions supervise the training programs of attached aviation companies in accordance with policies and directives provided by the aviation group. Air transport company commanders implement training programs established by higher headquarters. The company commander, or his delegated representative, selects personnel to fill school quotas, selects instructor personnel, and supervises training conducted within the unit. Continuous observation of training is necessary to evaluate how well training objectives are being accomplished.

34. Training Publications

a. Army training programs (ATP) are documents published by the Department of the Army that provide guidance in the preparation of training programs and schedules for specific Army units. ATP prescribe a general subject outline of training to be conducted by operational units and outline the minimum essential training required. ATP also prescribe the subject, number of hours to be devoted to each subject, and essential study references and training aids which apply to the training of specific units.

b. Army subject schedules (ASubjScd) are used to provide detailed guidance to instructors in preparation of lesson plans and scheduling of periods of instruction for training in a particular subject as outlined in ATP. There are two types of subject schedules: unit subject schedules for unit training and military occupational speciality (MOS) subject schedules for training in specific individual skills.

c. Army training tests (ATT) are used to evaluate the ability of units, both tactically and technically. Test scores determine whether the unit is sufficiently trained to accomplish its assigned mission and whether the individuals of the unit are MOS-qualified and are utilized correctly.

d. FM 21-5 and FM 21-6 contain basic guidance for Army training. Other military publications available for training purposes are listed in DA Pam 310-3.

35. Individual Training

a. Officers and Warrant Officers.

- (1) Army air transport units contain a greater proportion of officers and warrant officers than nonaviation units. In addition to being rated aviators, aviation officers must be equally proficient as ground officers. Therefore,

aviators assigned to air transport units require training in both ground and aviation tactics. This enables Army aviators to understand the mission of the supported units and to be more efficient in providing required support.

- (2) Even though the Army aviator in an air transport unit is primarily assigned to flying duty, he should be kept current on new tactics and techniques in order to continuously improve his flying ability. This may be accomplished through the unit's training program. Extensive training is necessary to keep the aviator proficient in both tactical and nontactical flying. Training must include instruction in the latest flight regulations and ground subjects, with cross training in all functions of the unit to which assigned.
- (3) Aviation training of officers also applies to warrant officers. They should be trained with, and observe the tactics and techniques of, the ground units that will be supported.

b. Enlisted.

- (1) *General.* Basic combat training for enlisted men is contained in ATP 21-114. The objective of basic combat training is to produce a physically conditioned soldier indoctrinated and drilled in the fundamentals of soldiering and familiar with basic military tactics. This training is important in aviation units, but the individual must also become a specialist in his MOS in order to perform his assigned duties. He must receive on-the-job training to develop his MOS proficiency, and he must maintain his basic soldiering ability.
- (2) *Specialist MOS training.* The training of enlisted specialists, particularly in communications, vehicle and aircraft maintenance, avionics, and air traffic control, is one of the air transport commanders most important training responsibilities. Specialist training, the foundation of which is

laid during the advanced individual phase of the enlisted man's training must be carefully planned and supervised. Specialist training is received at service schools and unit schools and through on-the-job training.

36. Unit Training

a. Unit training is that phase of the training program in which emphasis is placed on training personnel to function as members of a team or unit. During this training period, the unit usually spends much time in the field operating under conditions most likely to be encountered in combat. Unit training enables the Army air transport commander to evaluate the degree of proficiency of his unit in performing assigned tasks. Stress is placed on leadership, unit integrity, teamwork, operational competence, administrative efficiency, morale, and supply economy. Unit training consists of a basic unit training phase and an advanced unit training phase.

- (1) *Basic unit training phase.* The objective of the basic unit training phase is to develop effective and coordinated sections and teams from individuals who have learned particular skills and techniques during the individual training phase. The individual's skills and techniques are progressively developed to suit the requirements of the subordinate elements, with the view of producing an efficiently functioning unit.
- (2) *Advanced unit training phase.* The advanced unit training phase is designed to implement training previously received and to mold the subordinate elements of the unit into a smoothly functioning unit. The maximum possible unit training time should be spent in bivouacs conducted under simulated tactical situations. Particular attention should be given to operational competence, dispersion of elements, concealment, local security and defense, and CBR protective measures.

b. Bivouac operations during unit training provide the best opportunity to improve both

individual and unit proficiency towards the accomplishment of the unit's mission. Army air transport units will insure that sufficient training is scheduled to adequately develop the competence of individuals and elements when performing combat support and combat service support airlift operations. During operations under simulated tactical conditions, the capabilities and limitations of the unit are clearly disclosed. Any additional training necessary to prepare the unit for combined training or for participation in maneuvers is determined at that time.

37. Combined Airlift Training

a. It is most desirable to schedule combined airlift training between Army air transport units, terminal transfer elements, and supported forces. Supported forces can be either tactical units or service troops. Combined training promotes maximum understanding and coordination between the various units when engaged in combat support or combat service

support airlift operations. The aviation group provides the planning, coordination, and supervision necessary for the successful implementation of combined airlift training programs.

b. The following subjects should be included in the instructions given to personnel that participate in combined airlift training:

- (1) Conduct of combat support and combat service support airlift operations.
- (2) Indoctrination in psychological problems inherent to air transportation.
- (3) Preparation of aircraft loading plans.
- (4) Familiarization with loading, restraining, and unloading cargo.
- (5) Familiarization with tiedown devices and with methods of shoring cargo.
- (6) Manifesting and documenting aircraft loads.
- (7) Assembly techniques.
- (8) Safety, emergency, and signaling procedures for tactical air transport operations (STANAG 3465, app G).

APPENDIX A

REFERENCES

1. Army Regulations

AR 37-16	Accounting and Reporting for Operation, Maintenance, and Flying Hours of Army Aircraft.
AR 59-series	Air Transportation.
AR 95-series	Aviation.
AR 96-series	Air Transportation.
AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 350-1	Army Training.
AR 385-10	Army Safety Program.
AR 385-40	Accident Reporting and Records.
AR 600-105	Army Aviation Officer Career Program.
AR 600-106	Aeronautical Designations and Flying Status for Army Personnel.
AR 600-107	Medical Restriction from Flight Duty, Suspensions, Flying Evaluation Boards, and Flight Status Review System.
AR 700-26	Designating, Redesignating, and Naming Military Aircraft.
AR 750-1	Maintenance Concepts.
AR 750-8	Command Maintenance Management Inspections.

2. Field Manuals

FM 1-5	Aviation Company.
FM 1-10	Army Aviation Organization Aircraft Maintenance.
FM 1-15	Divisional Aviation Battalion and Group.
FM 1-60	Army Aviation Air Traffic Operations—Tactical.
FM 1-100	Army Aviation Utilization.
FM 1-105	Army Aviation Techniques and Procedures.
FM 1-110	Armed Helicopter Employment.
FM 7-20	Infantry, Airborne Infantry, and Mechanized Infantry Battalions.
FM 8-35	Transportation of the Sick and Wounded.
FM 11-21	Tactical Signal Communications Systems, Army, Corps, and Division.
FM 21-5	Military Training Management.
FM 21-6	Techniques of Military Instruction.
FM 21-26	Map Reading.
FM 21-30	Military Symbols.
FM 21-31	Topographic Symbols.
FM 23-65	Browning Machine Gun Caliber .50 HB, M2.
FM 31-11	Doctrine for Amphibious Operations.
FM 31-12	Army Forces in Amphibious Operations (the Army Landing Force).
FM 31-16	Counterguerrilla Operations.

FM 31-22	U. S. Army Counterinsurgency Forces.
FM 31-25	Desert Operations.
FM 31-30	Jungle Training and Operations.
FM 31-70	Basic Cold Weather Manual.
FM 31-71	Northern Operations.
FM 31-72	Mountain Operations.
FM 54-1	The Logistical Command.
FM 54-2	The Division Support Command.
FM 54-4	The Support Brigade.
FM 55-6	Transportation Services in Theaters of Operations.
FM 55-9	Transportation Services and the Transportation Brigade in the Field Army.
FM 55-10	Transportation Movements Services, Field Army.
FM 55-15	Transportation Reference Data.
FM 55-45	Aircraft Maintenance Services and Units in the Field Army.
FM 55-56	Transportation Terminal Transfer Company.
FM 57-10	Army Forces in Joint Airborne Operations.
FM 57-35	Airmobile Operations.
FM 100-5	Field Service Regulations—Operations.
FM 100-10	Field Service Regulations—Administration.
(C) FM 100-20	Field Service Regulations—Stability Operations (U).
FM 100-27	U. S. Army/U. S. Air Force Doctrine for Tactical Airlift Operations.
FM 101-5	Staff Officer's Field Manual; Staff Organization and Procedure.
FM 101-10-1	Staff Officer's Field Manual: Organization, Technical, and Logistical Data, Unclassified.
(C) FM 101-20	United States Army Aviation Planning Manual (U).

3. Technical Manuals

TM 1-series	Aviation.
TM 5-330	Planning, Site Selection, and Design of Roads, Airfields, and Heliports in the Theater of Operations.
TM 38-250	Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft.
TM 38-750	Army Equipment Record Procedures.
TM 38-750-1	Maintenance Management: Field Command Procedures.
TM 55-series	Transportation (Aviation and Air Transportability TM).
TM 57-210	Air Movement of Troops and Equipment.

4. Technical Bulletins

AVN-series	Aviation.
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5. Army Training Programs

ATP 20-5	Army Training Program for Field Exercises and Maneuvers.
ATP 21-114	Male Military Personnel Without Prior Service.

6. Department of Army Pamphlets

DA PAM Military Publication Indexes.
310-series

7. Tables of Organization and Equipment

TOE 1-207 Aviation Air Traffic Control Company.
TOE 1-252 Headquarters and Headquarters Company, Aviation Group.
TOE 1-256 Headquarters and Headquarters Company, Aviation Battalion.
TOE 1-258 Aviation Medium Helicopter Company.
TOE 1-259 Aviation Heavy Helicopter Company.
TOE 55-118 Transportation Terminal Transfer Company.

8. Form

DD Form 1384 Transportation Control and Movement Document.

9. JCS Publication

JCS Pub 2 Unified Action Armed Forces.

APPENDIX B

LIAISON OFFICER'S GUIDE

1. General

When an Army air transport unit is assigned an airlift mission, the commander will promptly establish liaison with the supported unit. Liaison is essential to insure proper planning between the participating units.

2. Planning Guide

The following list of items to be considered in planning is provided to assist in coordinating and executing successful airlift missions. However, the guide can only provide a representative listing of applicable factors. It must be recognized that each mission presents individual problems that require coordination and solving before the actual operation.

- a.* Supported unit.
- b.* Contact officer (supported unit liaison officer).
 - (1) Location.
 - (2) Time to be contacted.
- c.* Type of mission (troop movement, cargo airlift, unit airlift).
- d.* Situation.
 - (1) Ground tactical plan of supported unit.
 - (2) Intelligence.
 - (*a*) Enemy (ground and air).
 - (*b*) Friendly (ground and air).
 - (3) Strong points (antiaircraft, troops, armor).
- e.* Determination of aircraft requirements (type, composition of force).
- f.* Plan of execution.
 - (1) Time.
 - (2) Suggested flight routes.
 - (3) Flight altitudes to be flown.
 - (4) Departure points, checkpoints, and release points.
 - (5) Communications for flight control.

- (6) Coordination with supporting elements (weather forecaster, friendly fire support, traffic regulations, terminal forces).
- g.* Loading area.
 - (1) Coordinates.
 - (2) Description.
 - (3) Marking loading areas.
 - (4) Ground control frequencies and call signs.
 - (5) Officer in charge.
 - (6) Loading plan.
 - (*a*) General plan.
 - (*b*) Time of Loading.
 - (*c*) Priorities.
 - (*d*) Aircraft chalking and marking procedures.
 - (*e*) Traffic pattern.
 - (*f*) Manifesting and documentation procedures and responsibility for preparation.
 - (*g*) Personnel and cargo properly positioned and secured in aircraft.
 - (*h*) Safety factors involved.
- h.* Landing area.
 - (1) Coordinates.
 - (2) Description.
 - (3) Marking landing sites.
 - (4) Ground control frequencies and call signs.
 - (5) Traffic pattern.
 - (6) Unloading plan.
 - (*a*) Unloading procedures.
 - (*b*) Time of unloading.
 - (*c*) Safety precautions.
- i.* Refueling facilities.
 - (1) Location.
 - (2) Capabilities, requirements, and procedures.
- j.* Alternate plan to cover:
 - (1) Weather abort.
 - (2) Mechanical abort.
 - (3) Loss of communication.

- (4) Enemy action.
- (5) Alternate flight routes.
- (6) Spare aircraft allocated and procedures for employment.

- k.* Arrangement for up-to-date weather information and briefing.
- l.* Mission debriefing.
- m.* Rehearsals and training procedures.

APPENDIX C

DETERMINING AIRCRAFT REQUIREMENTS

1. General

a. To determine the number of aircraft required for a mission, the types and characteristics of available aircraft must be considered in relation to the following:

- (1) Cargo carrying characteristics:
 - (a) Size and location of cargo door and height above ground.
 - (b) Size and shape of cargo compartment and limiting features.
 - (c) Floor strength and location and strength of tiedown fittings.
 - (d) Location and number of troop seats.
 - (e) Forward and aft center of gravity.
- (2) Allowable cargo load. The weight in pounds of personnel and cargo that an aircraft can airlift for a specific mission (allowable cargo load) is provided by the air transport commander based on technical considerations.
- (3) Weight and dimensions of commodity to be airlifted.

b. For Army combat support and combat service support airlift, the standard weights for individuals are as shown below. These weights take into consideration the weight of the man, plus his combat weight and his share of TOE equipment that is hand-carried.

- (1) Aircraft crewman, 200 pounds.
- (2) Combat-equipped soldier, 240 pounds.
- (3) Litter patient, 250 pounds.

c. The size and shape of individual items of cargo are particularly important when Army transport aircraft are providing the airlift. The interior cabin space of these aircraft is limited in comparison to the larger transport aircraft operated by the Air Force. Items of cargo whose dimensions exceed the interior cabin space may be airlifted externally by Army transport helicopters.

d. Considering the above factors, aircraft requirements can be determined by either the weight or type load method.

2. Weight Method

The weight method is used for estimating aircraft requirements to transport large amounts of supplies, general cargo, and personnel. This method is based on the assumption that total weight is the determining factor. The weight method is not accurate for unit movements that necessitate maintaining unit integrity and airlifting major items of equipment. A sample application of the weight method follows:

Weight to be transported, 79,000 pounds.
Allowable cargo load per aircraft, 11,000 pounds.
$$\frac{79,000}{11,000} = 7.18 \text{ or } 8 \text{ aircraft required.}$$

3. Type Load Method

a. The type load method is based on arranging combination loads of men, equipment, and cargo within the allowable cargo load limit of the aircraft. This method is particularly useful for airlifting small units or elements with their equipment and maintaining unit integrity. Listed below are four sample type loads:

- Type 1:* 2 1/4-ton trucks
3 men
- Type 2:* 1 1/4-ton truck
1 1/4-ton trailer (loaded)
4 men
- Type 3:* 1 1/4-ton truck
2 1/4-ton trailers
9 men
- Type 4:* 1 1/4-ton truck
1 106-mm rifle (truck-mounted)
1 106-mm rifle (truck-mounted)
2 rounds of 106-mm ammunition
10 men

b. Normally, each aircraft transporting a type load is identified by a chalk number marked on the fuselage. The aircraft then become identified as chalk number 1, 2, etc. This permits the personnel who are to be airlifted to more easily identify the aircraft assigned a particular type load.

APPENDIX D

ARMY-AIR FORCE AGREEMENT OF 6 APRIL 1966

"The Chief of Staff, United States Army, and the Chief of Staff, United States Air Force, have reached an understanding on the control and employment of certain types of fixed and rotary wing aircraft and are individually and jointly agreed as follows:

"A. The Chief of Staff, U.S. Army, agrees to relinquish all claims for CV-2 and CV-7 aircraft and for future fixed wing aircraft designed for tactical airlift. These assets now in the Army inventory will be transferred to the Air Force. (Chief of Staff, Army, and Chief of Staff, Air Force, agree that this does not apply to administrative mission support fixed wing aircraft.)

"B. The Chief of Staff, U.S. Air Force, agrees—

"(1) To relinquish all claims for helicopters and follow-on rotary wing aircraft which are designed and operated for intra-theater movement, fire support, supply, and resupply of Army forces and those Air Force control elements assigned to DASC and subordinate thereto. (Chief of Staff, Army, and Chief of Staff, Air Force, agree that this does not include rotary wing aircraft employed by Air Force SAW or SAR forces and rotary wing administrative mission support aircraft.) (Chief of Staff, Army, and Chief of Staff, Air Force, agree that the Army and Air Force jointly will continue to develop VTOL aircraft. Dependent upon evolution of this type aircraft, methods of employment and

control will be matters for continuing joint consideration by the Army and Air Force.)

"(2) That, in cases of operational need, the CV-2, CV-7, and C-123 type aircraft performing supply, resupply, or troop-lift functions in the field army area, may be attached to the subordinate tactical echelons of the field army (corps, division, or subordinate commander), as determined by the appropriate joint/unified commander. (Note: Authority for attachment is established by subsection 6, Sec. 2 of JCS Pub 2, Unified Action Armed Forces (UNAAF).)

"(3) To retain the CV-2 and CV-7 aircraft in the Air Force structure and to consult with the Chief of Staff, U.S. Army, prior to changing the force level of, or replacing, these aircraft.

"(4) To consult with the Chief of Staff, U.S. Army in order to arrive at takeoff, landing, and load carrying characteristics on follow-on fixed wing aircraft to meet the needs of the Army for supply, resupply, and troop movement functions.

"C. The Chief of Staff, U.S. Army, and the Chief of Staff, U.S. Air Force, jointly agree—

"(1) To revise all service doctrinal statements, manuals, and other material in variance with the substance and spirit of this agreement.

"(2) That the necessary actions resulting from this agreement be completed by 1 January 1967."

ANNEX A TO DETAILS OF AGREEMENT OF STANAG 3117
(Edition No. 3)

Section 1

GENERAL AIRCRAFT MARSHALLING FOR ALL AIRCRAFT

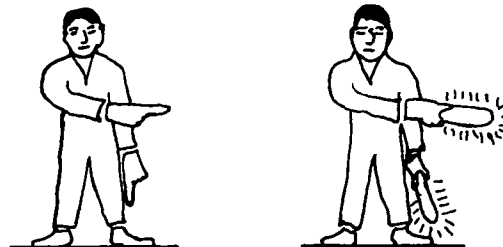
NOTE:

1. The signals to an aircraft on movement areas are designed for use by the marshaller facing the aircraft in a position:
 - a. for fixed wing aircraft, forward of the left wing tip within view of the pilot; and
 - b. for helicopters, where he can best be seen by the pilot.
2. For night operations, the wands should not be too bright and used in pairs of the same color.
3. The signals listed below may be used by the pilot as appropriate, using the signal in a similar way to that indicated.

1-1 PROCEED TO NEXT MARSHALLER

Right or left arm down, other arm moved across the body and extended to indicate direction of next marshaller.

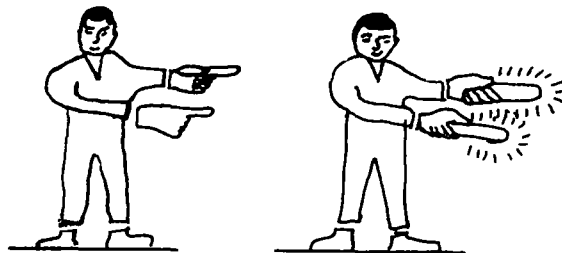
No equivalent ICAO signal



Signal 1-1

Alternate Signal:

One arm extended and the other across the chest with both hands pointed to indicate direction of next marshaller.

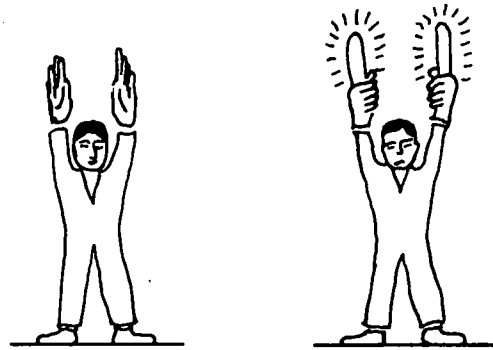


Alternate signal 1-1

1-2 THIS MARSHALLER

Arms above head in vertical position with palms facing inward.

Conforms to ICAO signal "THIS WAY"

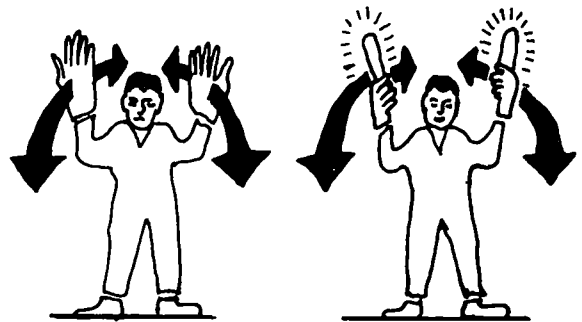


Signal 1-2

1-3 MOVE AHEAD

Arms a little aside, palms facing backwards and repeatedly moved upward-backward from shoulder height.

Conforms to ICAO signal



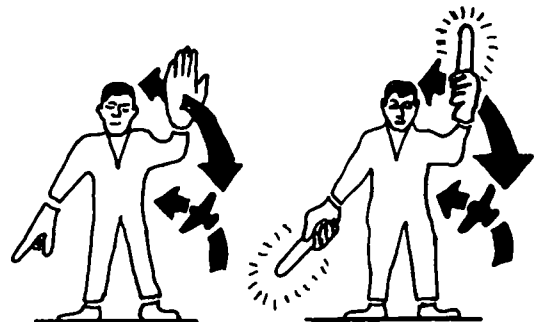
Signal 1-3

1-4 TURN

a. TURN TO PORT (LEFT)

Point right arm downward, left arm repeatedly moved upward-backward. Speed of arm movement indicating rate of turn.

Conforms to ICAO signal

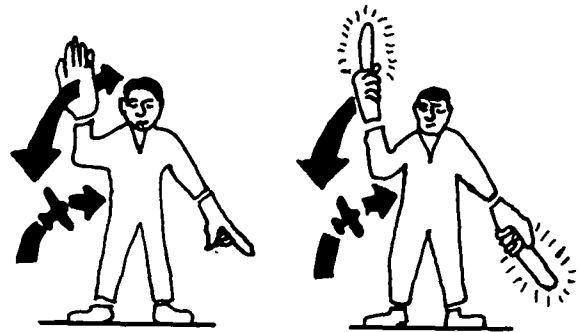


Signal 1-4a

b. TURN TO STARBOARD (RIGHT)

Point left arm downward, right arm repeatedly moved upward-backward. Speed of arm movement indicating rate of turn.

Conforms to ICAO signal

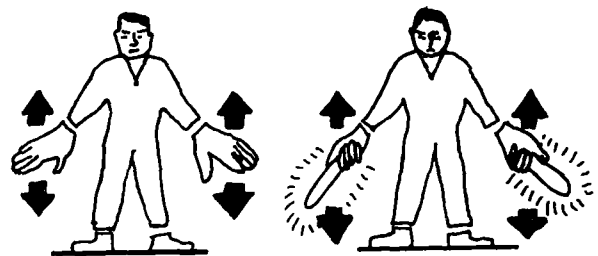


Signal 1-4b

1-5 SLOW DOWN

Arms down with palms toward ground, then moved up and down several times.

Conforms to ICAO signal

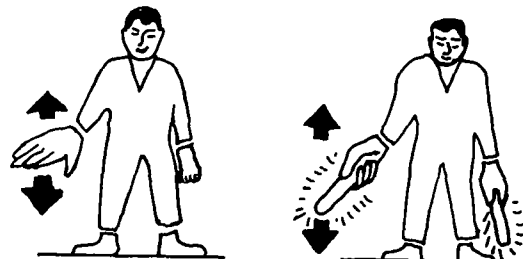


Signal 1-5

1-6 SLOW DOWN ENGINE(S) ON INDICATED SIDE

Arms down with palms toward ground, then either right or left arm moved up and down indicating that left or right side engines respectively should be slowed down.

Conforms to ICAO signal

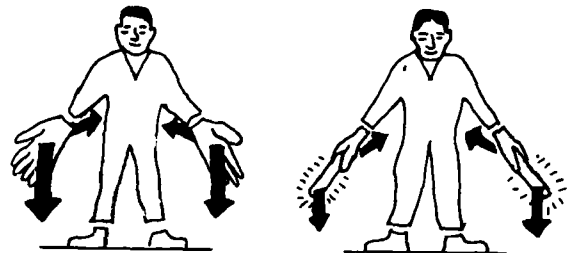


Signal 1-6

1-7 ROLL BACK (ALSO USED TO PULL BACK AIRPLANE UTILIZING ARRESTING WIRE)

Arms down, palms open facing forward, sweeping backwards and forwards movement with the arms.

Conforms to ICAO signal



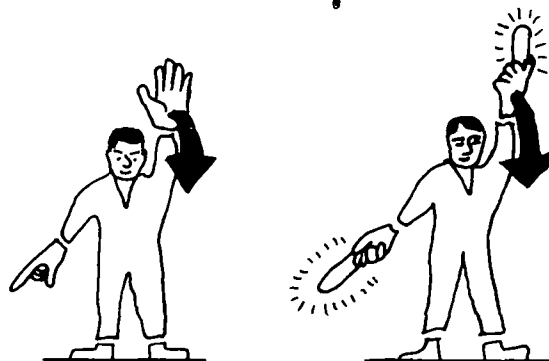
Signal 1-7

1-8 TURNS WHILE BACKING

a. TAIL TO PORT (LEFT)

Point right arm down and left arm brought from overhead, vertical position to horizontal forward position, repeating left arm movement.

Conforms to ICAO signal

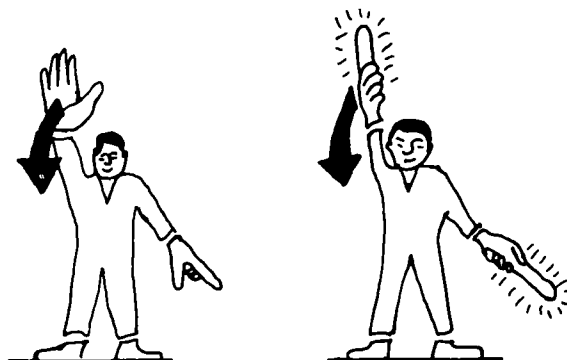


Signal 1-8a

b. TAIL TO STARBOARD (RIGHT)

Point left arm down and right arm brought from overhead, vertical position to horizontal forward position, repeating right arm movement.

Conforms to ICAO signal



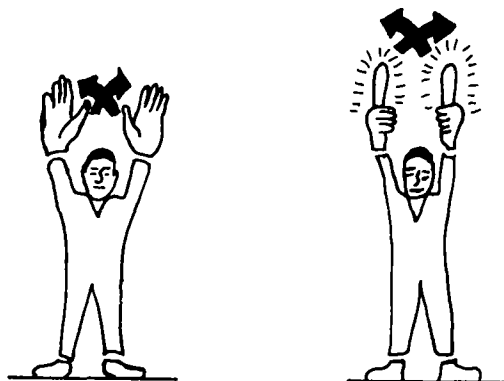
Signal 1-8b

1-9 STOP

Arms repeatedly crossed above head (the rapidity of the arm movement should be related to the urgency of the stop i.e., the faster the movement the quicker the stop).

Conforms to ICAO signal

NOTE: Optional for Naval use. See also Signal Number 2-4.



Signal 1-9

1-10 BRAKES

a. ON

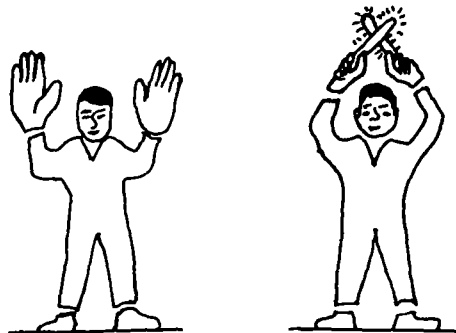
DAY—Open palm and fingers raised with palm toward aircraft, then fist clenched.

NIGHT—Crossed wands.

b. OFF

DAY—Reverse of above

NIGHT—Crossed wands, uncrossed.

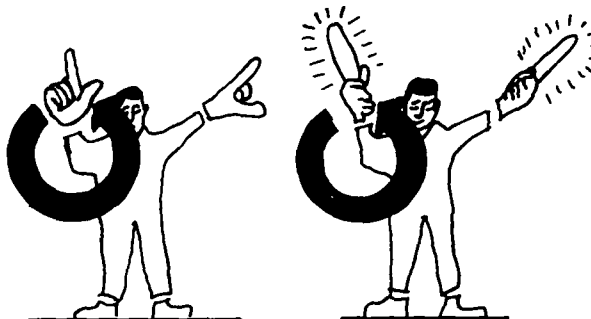


Signal 1-10

1-11 START ENGINE(S)

Circular motion in vertical plane of right hand at head level with left arm pointing to engine.

Conforms to ICAO signal

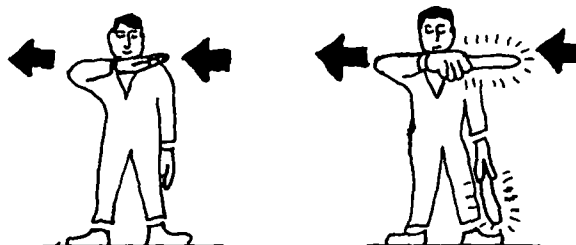


Signal 1-11

1-12 CUT ENGINE(S)

Either arm and hand level with shoulder, hand moving across throat, palm downward.

Conforms to ICAO signal



Signal 1-12

1-13 AUXILIARY POWER UNIT

a. CONNECTED

Hands above head, left fist partially clenched, right hand moved in direction of left hand with first two fingers extended and inserted into circle made by fingers of the left hand.



Signal 1-13a

b. DISCONNECTED

Hands above head, left fist partially clenched, right hand moved away from left hand, withdrawing first two fingers from circle made by fingers of the left hand.

No ICAO signal



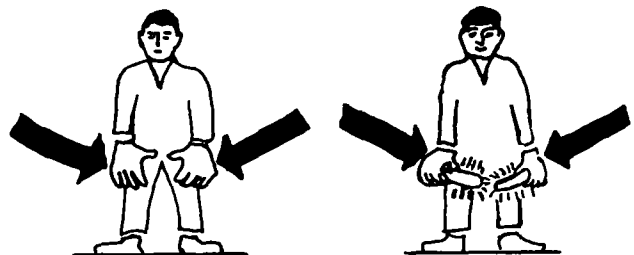
Signal 1-13b

1-14 CHOCKS (and/or HELICOPTER TIE DOWNS)

a. INSERT CHOCKS

Arms down, fists closed, thumbs extended inwards swinging arms from extended position inwards.

Conforms to ICAO signal

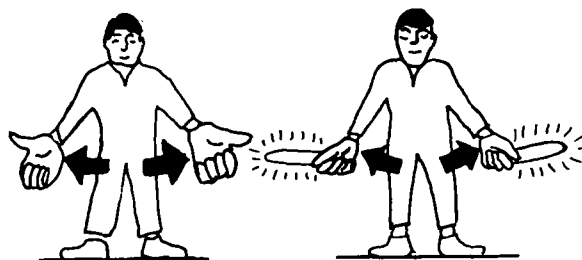


Signal 1-14a

b. REMOVE CHOCKS

Arms down, fists closed, thumbs extended outwards swing arms outwards.

Conforms to ICAO signal



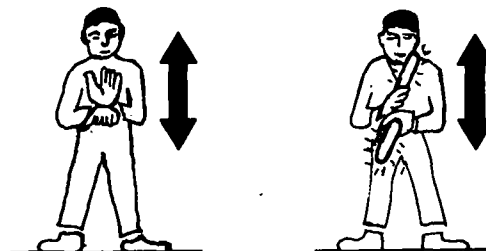
Signal 1-14b

1-15 FLAPS

a. LOWER WING FLAPS

Hands in front, palms together horizontally then opened from the wrist alligator-mouth fashion.

No equivalent ICAO signal

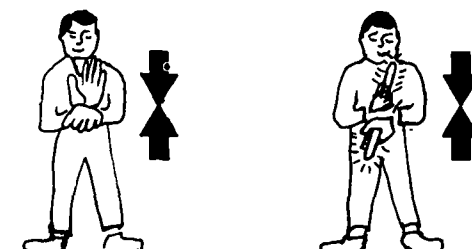


Signal 1-15a

b. RAISE WING FLAPS

Hands in front, horizontally, with palms open from the wrists, then suddenly closed.

No equivalent ICAO signal



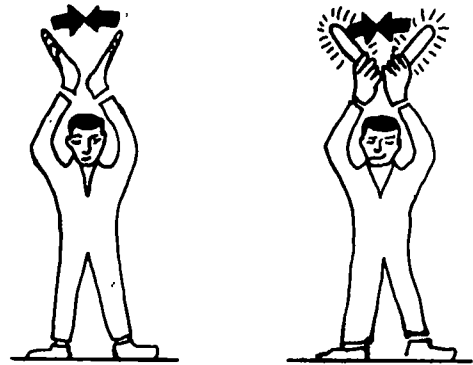
Signal 1-15b

1-16 TAIL WHEEL

a. LOCK

Hands together overhead, palms open from the wrists in a vertical V, then close suddenly.

No equivalent ICAO signal

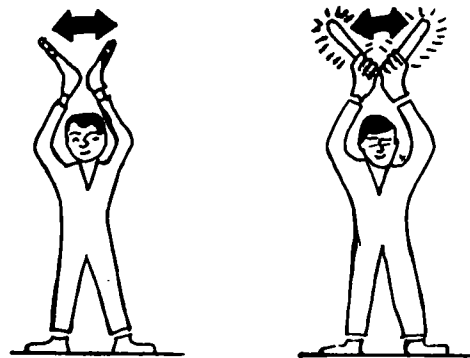


Signal 1-16a

b. UNLOCK

Hands overhead, palms together then opened from the wrists to form a vertical V.

No equivalent ICAO signal



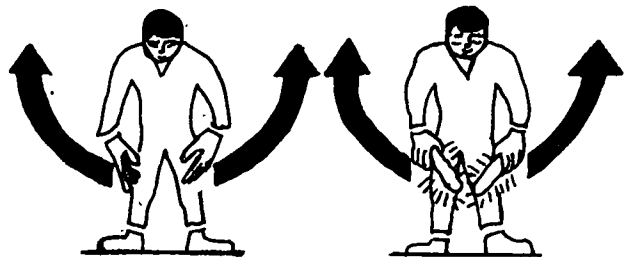
Signal 1-16b

1-17 BOMB BAY

a. OPEN

Hand to be held with fingertips touching in front of the body, then swung down and outwards.

No equivalent ICAO signal:

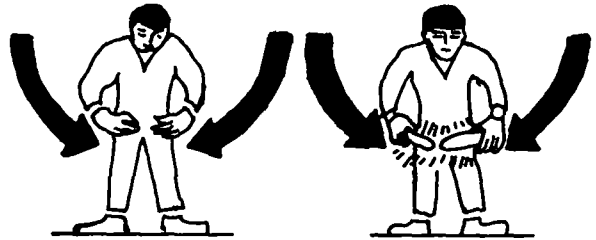


Signal 1-17a

b. CLOSE

Arms to be extended, then swung downward and in until fingertips touch in front of the body with elbows bent at approximately 45 degrees.

No equivalent ICAO signal



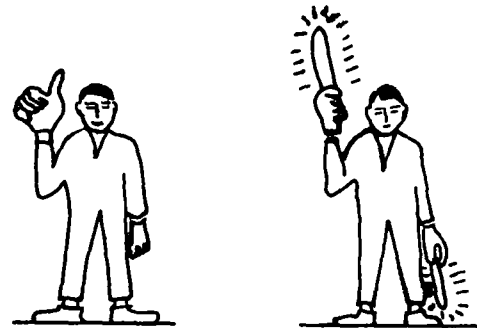
Signal 1-17b

1-18 SIGNALS FOR GENERAL USE

a. AFFIRMATIVE SIGNAL

Hand raised, thumb up.

No equivalent ICAO signal

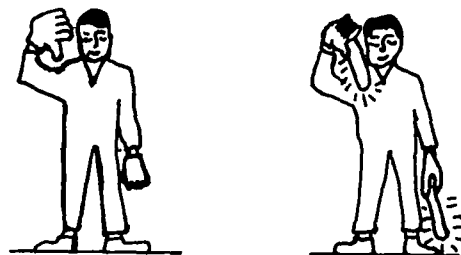


Signal 1-18a

b. NEGATIVE SIGNAL

Hand raised, thumb down.

No equivalent ICAO signal



Signal 1-18b

Section 2

ADDITIONAL SIGNALS FOR CONTROLLING
AIRCRAFT OPERATING FROM SHIPS

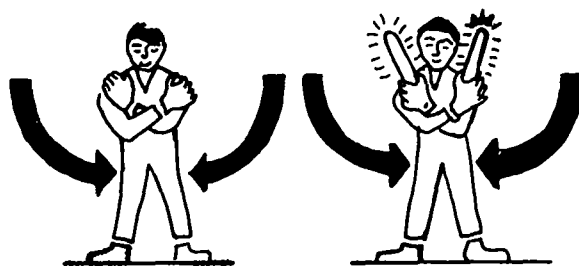
The following procedures and signals are provided for landing and operating aircraft on ships and for ground control of aircraft at Naval Air Stations in addition to those contained in Sections I and III:

A. Signals for Controlling Conventional fixed wing Aircraft.

2-1 WINGS

a. FOLD WINGS

Arms straight out at sides, then swept forward and hugged around shoulders.

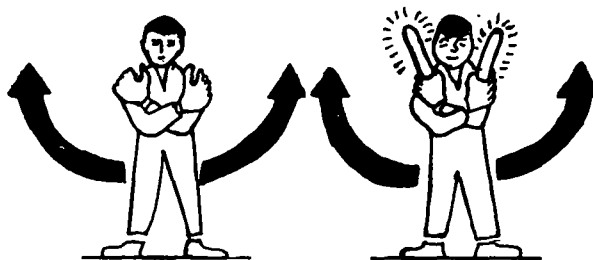


Signal 2-1a

b. SPREAD WINGS

Arms hugged around shoulders, then swept straight out to the sides.

No equivalent ICAO signal

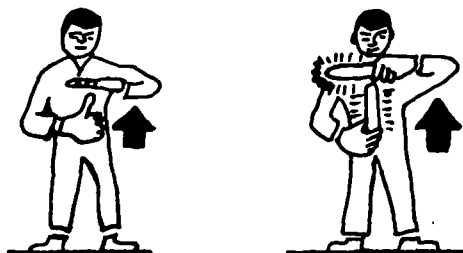


Signal 2-1b

2-2 TAIL HOOK

a. UP HOOK

Right fist, thumb extended upward, raised suddenly to meet horizontal palm of left hand.

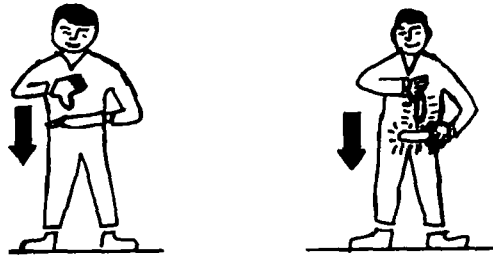


Signal 2-2a

b. DOWN HOOK

Right fist, thumb extended downward, lowered suddenly to meet horizontal palm of left hand.

No equivalent ICAO signal

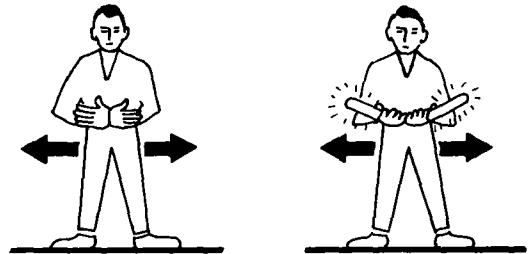


Signal 2-2b

2-3 DIVE BRAKES

a. OPEN DIVE BRAKES

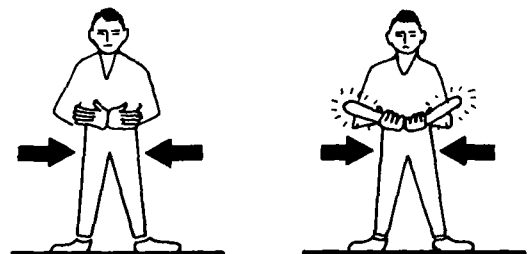
Hands in front, palms together vertically, then opened from the wrists alligator-mouth fashion.



Signal 2-3a

b. CLOSE DIVE BRAKES

Hands in front, vertically with palms open from wrists, then suddenly closed.

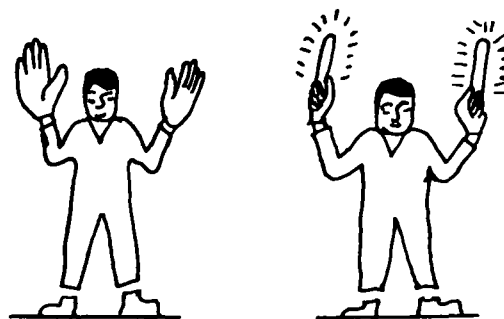


Signal 2-3b

2-4 STOP

Raise both hands to eye level, elbows flexed, palms toward pilot, in a simple policeman's stop.

NOTE. See signal 1-9



Signal 2-4

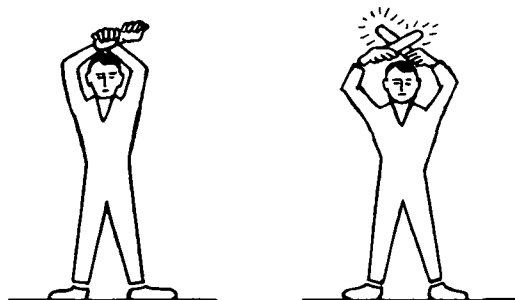
2-5 EMERGENCY STOP

a. DAY:

Cross forearms overhead with fists clenched.

b. NIGHT:

Cross the night signalling wands.

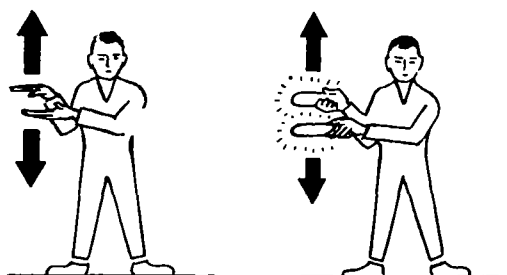


Signal 2-5

2-6 ROCKET PODS

a. OPEN ROCKET PODS

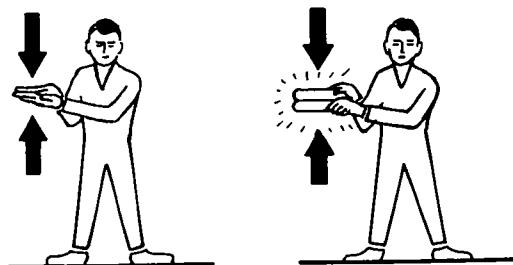
Right arm extended with palm down. Left arm extended with palm up and about six inches directly below right hand.



Signal 2-6a

b. CLOSE ROCKET PODS

Same as "Open Rocket Pods", but with hands brought together.



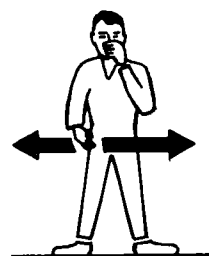
Signal 2-6b

2-7 TILLER BAR/STEERING ARM IN PLACE

Hold nose with left hand right hand moving horizontally at waist level.

a. A "thumbs up" immediately following signals means: MAN IS TENDING BAR.

b. A "thumbs down" immediately following signal means: NO ONE TENDING BAR.



Signal 2-7

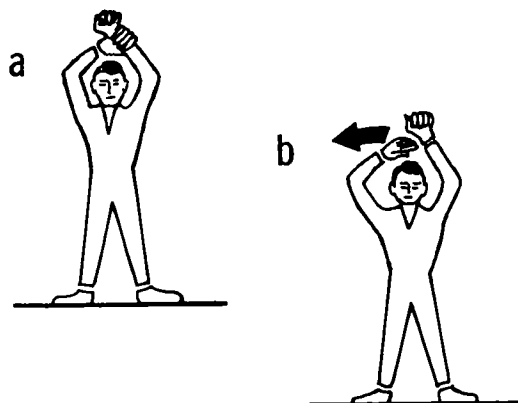
2-8 DOWNLOCKS

a. INSTALL DOWNLOCKS

Clasp forearm with hand.

b. REMOVE DOWNLOCKS

Unclasp hand from forearm.



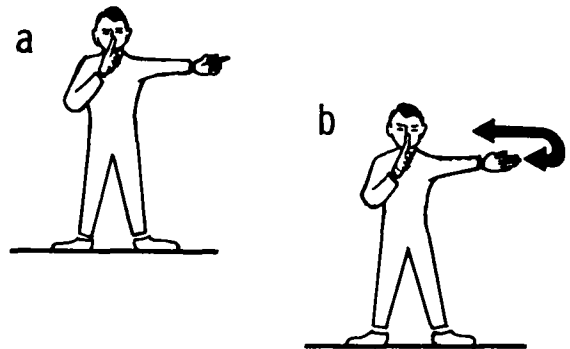
Signal 2-8

2-9 ENGAGE NOSEGEAR STEERING

a. Point to nose with index finger while indicating direction of turn with other index finger.

DISENGAGE NOSEGEAR STEERING

b. Point to nose with index finger, lateral wave with open palm of other hand at shoulder height.



Signal 2-9

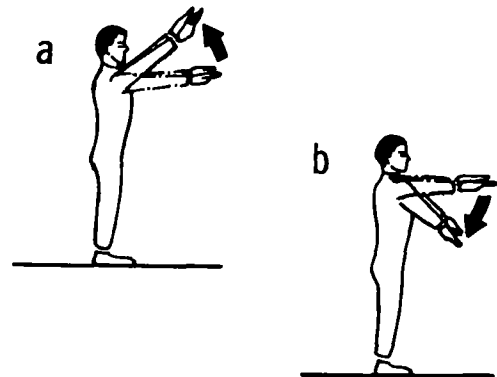
2-10 WING POSITION

a. WING UP

Both arms extended horizontally in front of body, palms down. Raise arms to 45 degree angle.

b. WING DOWN

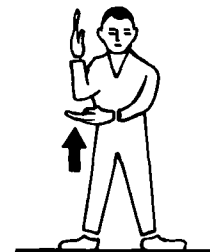
Reverse "WING UP" signal.



Signal 2-10

2-11 LOCK WINGS

Hit right elbow with palm of left hand.



Signal 2-11

Numbers 12 through 20 have not been assigned.

B. Signals for controlling Hovering aircraft.

2-21 REMOVE BLADE CUFFS

Red flag held in left hand above head, right hand pointing to individual boots for removal.



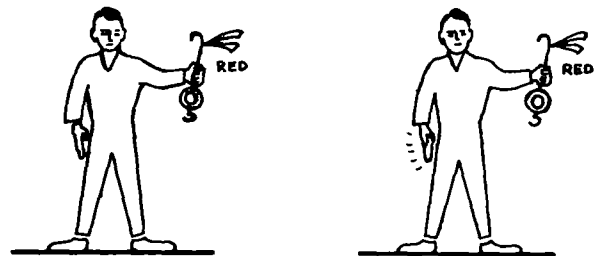
Signal 2-21

2-22 READY FOR TAKE-OFF

Thumb extended at eye level.



Signal 2-22

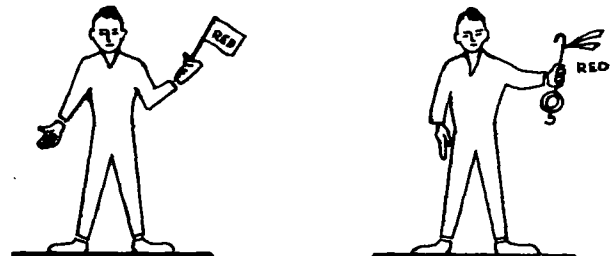


Signal 2-23

2-23 REELMEN SHOW REELS TO PILOT AND DIRECTOR

Reelmen (2 or 3, as applicable) remove tie-downs and move forward into full view of pilot and director with red-pennanted tie-downs held aloft. Director hold red flag in left hand over head and gives "thumbs-up" by right hand held extended at his side.

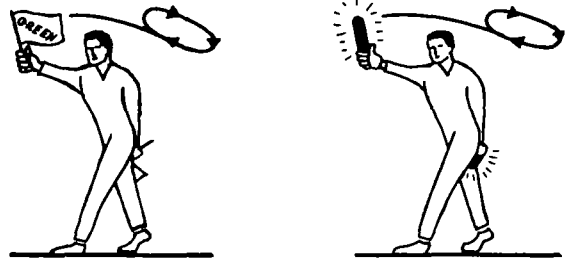
IMPORTANT: Without tie-downs, helicopter may start to overturn, in heavy seas. "Thumbs-up" indicates to pilot that he could now make emergency take-off.



2-24 TAKE-OFF

DAY—Director conceals red flag in left hand and makes circular motion of green flag in right hand over head in horizontal plane ending in a throwing motion of arm toward direction of take-off.

NIGHT—Use red and green wands rather than flags.

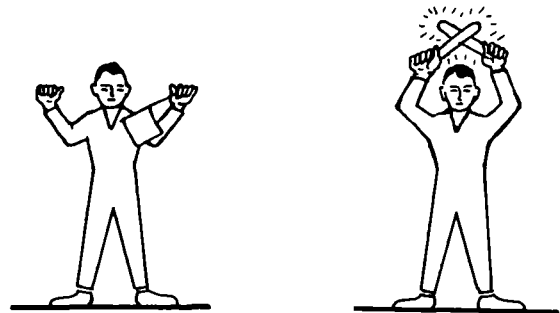


Signal 2-24

2-25 HOLD POSITION

DAY—Fists clenched at eye level, regardless of color of flag held.

NIGHT—Crossed wands over head, Director crosses two wands held regardless of color.

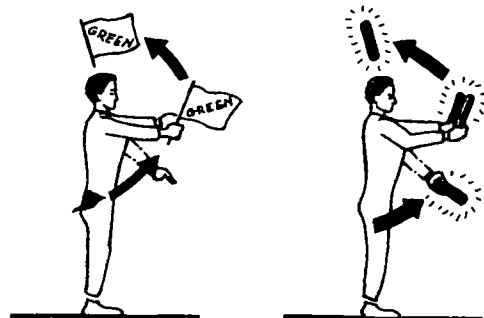


Signal 2-25

2-26 LANDING DIRECTIONS

DAY—Director places back to wind and faces direction from which approach is to be made; moves arms from sides to horizontal position, green flag in right hand, red flag concealed in hip pocket. Finish signal with green flag above head, left index finger pointing to landing spot.

NIGHT—Same as day, using green and amber wands.

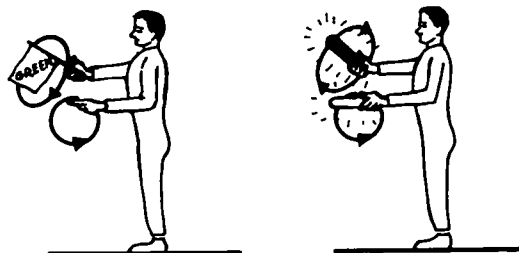


Signal 2-26

2-27 LOWER WHEELS

DAY—When pilot approaches director with landing gear retracted, director gives pilot signal by side view of a cranking circular motion of the hands, green flag in right hand.

NIGHT—Same as day, using green and amber wands rather than green flag.



Signal 2-27

2-28 DROOP STOPS NOT IN

After pilot disengages rotors, director holds "thumbs down" on pilot until droop stops drop in.

2-29 DROOP STOPS ARE IN

Director indicates by "thumbs-up" that droop stops have dropped in.

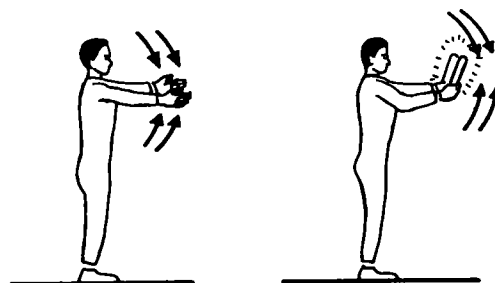


Signals 2-28 and 2-29

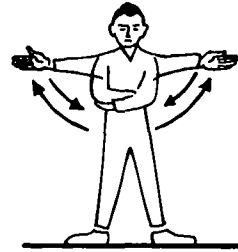
2-30 HOOK NOT DOWN (OR UP)

DAY—Short chopping motion to the side with arms to indicate "hook not down" or "hook not up". Meaning depends on position of hook when signal given. Hands alternate, using up and down chopping action.

NIGHT—Same as day, using green and amber wands.



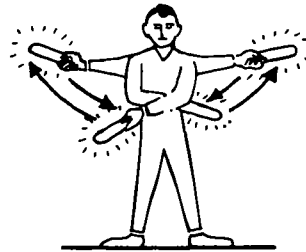
Signal 2-30



2-31 OPEN/CLOSE BOW DOORS

DAY—Director uses arms from a “bear hug” position to arms wide apart at shoulder height for opening bow doors. Reverse signal for closing bow doors.

NIGHT—Same as day, using green and amber wands if helicopter is hovering, and red and amber if on the deck.



Signal 2-31

Section 3

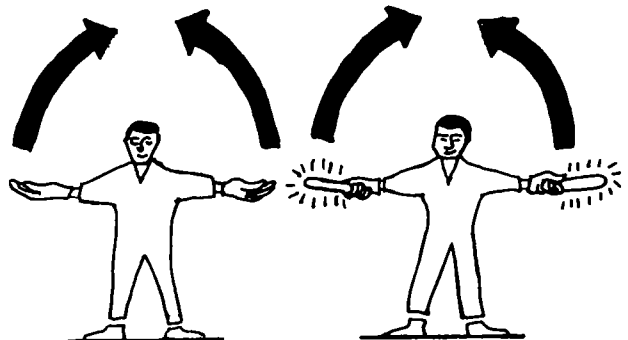
SPECIAL AIRCRAFT MARSHALLING SIGNALS
FOR HOVERING VTOL AND CUSHION AIRCRAFT

3-1 VERTICAL MOVEMENT

a. MOVE UPWARDS

Arms extended horizontally sideways beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.

Conforms to ICAO signal

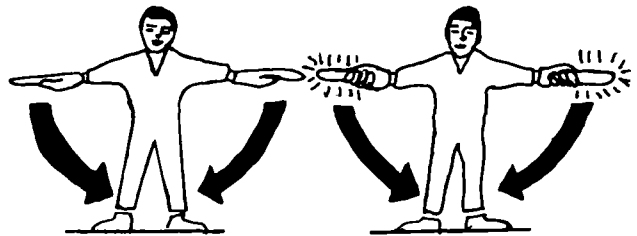


Signal 3-1a

b. MOVE DOWNWARDS

Arms extended horizontally sideways beckoning downwards, with palms turned down. Speed of movement indicates rate of descent.

Conforms to ICAO signal



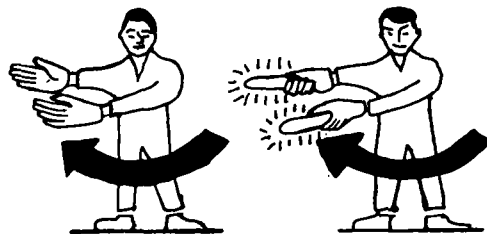
Signal 3-1b

3-2 HORIZONTAL MOVEMENT

a. MOVE TO PORT (LEFT)

Right arm extended horizontally sideways in direction of movement and other arm swung in front of body in same direction, in a repeating movement.

Conforms to ICAO signal

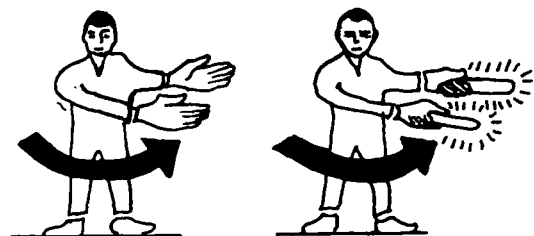


Signal 3-2a

b. MOVE TO STARBOARD (RIGHT)

Left arm extended horizontally sideways in direction of movement and other arm swung in front of body in same direction, in a repeating movement.

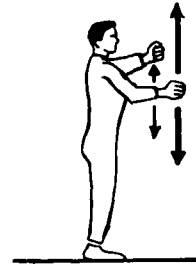
Conforms to ICAO signal



Signal 3-2b

3-3 HOOK UP LOAD

Rope climbing motion with hands.

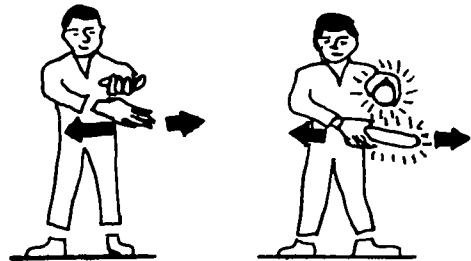


Signal 3-3a

b. RELEASE LOAD

Left arm extended forward horizontally, fist clenched, right hand making horizontal slicing movement below the left fist, palm downward.

No equivalent ICAO signal

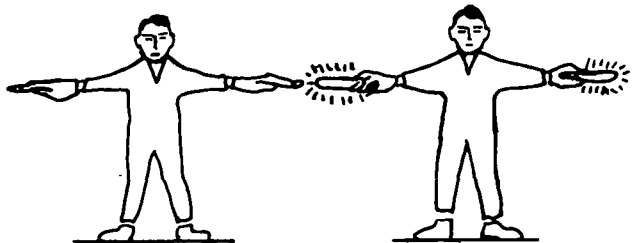


Signal 3-3b

3-4 HOVER

Arms extended horizontally sideways, palms downward.

Conforms to ICAO signal

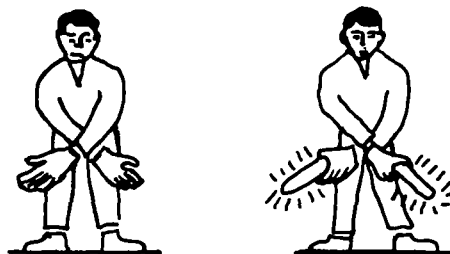


Signal 3-4

3-5 LAND

Arms crossed and extended downwards in front of the body.

Conforms to ICAO signal



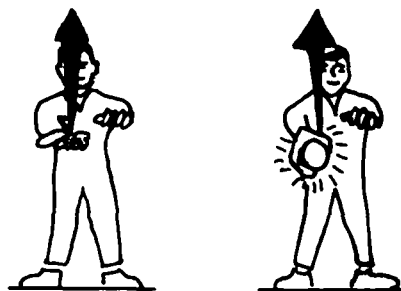
Signal 3-5

3-6 WINCH

a. WINCH UP

Left arm horizontal in front of body, fist clenched, right hand with palm turned upwards making upward motion.

No equivalent ICAO signal

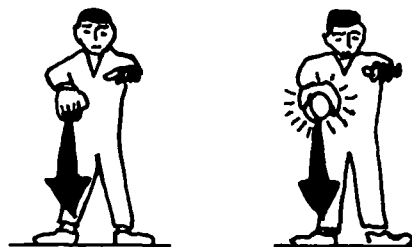


Signal 3-6a

b. WINCH DOWN

Left arm horizontal in front of body, fist clenched; right hand with palm turned downwards making downward motion.

No equivalent ICAO signal

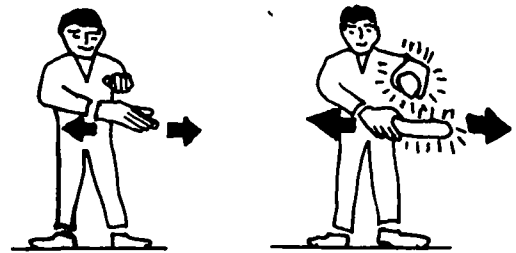


Signal 3-6b

c. CUT CABLE

A signal the same as "RELEASE LOAD" to be used only when winching.

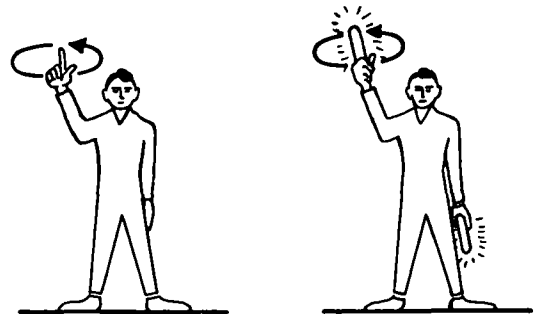
No equivalent ICAO signal



Signal 3-6c

3-7 ENGAGE ROTORS

Circular motion in horizontal plane with right hand above head.



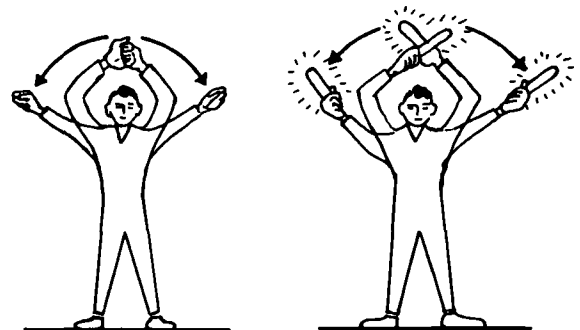
Signal 3-7

3-8 WAVE OFF

Landing officer waves arms overhead. "Go around".

NIGHT—Same as day using green and amber wands.

NOTE: Applies regardless of color of signal device.



Signal 3-8

Section 4

DISTINCTIVE GARMENT TO BE WORN BY AIRCRAFT

MARSHALLERS

1. The distinctive garment described below will be worn by aircraft marshallers to enable flying personnel of one NATO Nation to identify as such the aircraft marshallers of another, and so to promote the safety and efficiency of NATO Forces.
2. The garment will be of fluorescent international orange color or yellow and consist of a sleeveless garment, reaching to the waist both at the front and back, covering the shoulders and tied by ribbons at the waist, the garment may be marked with individual numbers on the front and back at the discretion of participating nations.

APPENDIX F

STANAG NO. 3327

AIR TRANSPORTATION OF DANGEROUS CARGO

NATO—UNCLASSIFIED

Original English/French Translation

STANAG NO. 3327

DETAILS OF AGREEMENT

AIR TRANSPORTATION OF DANGEROUS CARGO

1. Participants agree that the categorization and authorization for the transport by air of explosives, radioactive materials and other dangerous cargo (for example, corrosive, poisonous or highly inflammable materials) by each NATO nation will be acceptable by the other NATO nations as applicable for onward carriage by their own military aircraft during emergency or war.
2. Special restrictions and precautions in handling will be notified by the originating nation to the other nation(s) concerned at the time acceptance is sought.
3. Qualified escorts will be provided as required by the originating nation.
4. In the case of dangerous cargo being handed over from one nation to another for onward carriage without previous or accompanying instructions as to safety precautions to be observed during transport, the safety regulations of the nation accepting the cargo will apply.

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APPENDIX G
STANAG 3465
SAFETY EMERGENCY AND SIGNALLING PROCEDURES FOR
TACTICAL AIR TRANSPORT OPERATIONS

NATO—UNCLASSIFIED

Original French/English Translation

STANAG 3465

(Edition No. 3)

DETAILS OF AGREEMENT (DofA)

SAFETY EMERGENCY AND SIGNALLING PROCEDURES FOR
TACTICAL AIR TRANSPORT OPERATIONS

Annexes: A (DofA)—Safety Perimeter and Vehicle Access Routes to
Transport Aircraft

AGREEMENT

1. Safety on the Ground.

For each type of aircraft, a safety perimeter must be defined and forbidden to all personnel not taking part in the maintenance, supplying, and loading operations.

a. Safety Perimeter. Annex A shows a typical safety perimeter.

b. Vehicle Traffic.

- (1) All traffic on the airfield will be regulated according to a traffic plan. The maximum speed of vehicles must be indicated by signposts on congested or dangerous routes.
- (2) The movement of vehicles is forbidden within the safety perimeter except for supply, loading, or unloading operations. A diagram for approach and clearing by vehicles is shown in Annex A—Safety Perimeters.

c. Loading, Unloading and Supplying of Aircraft.

- (1) In order to avoid any damage to the aircraft, the loading and unloading operations must be carried out under the control of a competent representative of the Air Transport Unit with experienced personnel and appropriate equipment.
- (2) Special attention must be given to the movement of vehicles within the safety perimeter. In all cases chocks will be placed at such a distance that the vehicle cannot damage the aircraft.

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- (3) The loading and unloading of heavy or bulky loads must be carried out with special precautions.

d. Fire Risks.

- (1) It is essential that all fire risks be eliminated on the hard standings. Any flame must be prohibited within 30 meters of the safety perimeter. Smoking will be prohibited within the same area.
- (2) Fire extinguishing equipment (extinguishers, sand) must be placed in conspicuous positions near the hard standings.

e. Explosives, Ammunition, Dangerous Cargoes.

- (1) Those must be stocked at the prescribed safety distance (where applicable) from the hard standings.
- (2) The handling of this type of cargo must be carried out with the prescribed precautions.
- (3) The air transport unit will ensure that aircraft are properly earthed (grounded) to provide for electrical discharge.

2. Safety Precautions Related to Air Transport.

- a. Before each flight, the Captain of the aircraft or his designated representative must explain the emergency procedures to all transported personnel i.e., emergency, hook-up, abandon aircraft, forced landing, and ditching signals. The drop and emergency signals will be tested before taxiing.
- b. Smoking will be prohibited inside the aircraft on the ground. In flight, permission to smoke will be granted at the discretion of the Captain of the aircraft or his designated representative. Under no circumstances will smoking be allowed—
 - (1) During refuelling.
 - (2) When fuel vapours are detected in the aircraft.
 - (3) In aircraft with fuselage supplementary fuel tanks.
- c. All equipment (e.g., wheel chocks, tool boxes, luggage, cargo or safety equipment) must be lashed in the aircraft before taxiing. The lashing must be checked by the aircraft Captain or his designated representative during pre-flight inspection and periodically during flight.
- d. Crew and passengers must be strapped in their seats before taxiing and will remain so until authorised, by the Captain of the aircraft or his designated representative, to unfasten their seat belts. Seat belts will be fastened in flight when ordered by the aircraft captain. After landing seat belts will only be unlocked after the aircraft has come to rest, all engines stopped.

NOTE:

This procedure may be modified in the case of assault landings.

- e. The wearing of parachutes by crew and airborne personnel will be as prescribed by the national authority operating the aircraft.

- f. In flight over water, life jackets will be worn at the discretion of the Captain or his designated representative.
 - g. In flight, movements by passengers in the aircraft will be kept to a minimum. Only personnel authorised by the Captain of the aircraft or his designated representative may enter the crew compartment.
 - h. The Captain of the aircraft is responsible for ensuring that passengers obey the safety and emergency rules.
 - j. All dangerous material will be stowed in such a manner that it will be easily accessible in flight without moving other cargo.
 - k. All dangerous material will be loaded and stored away from oxygen and heating outlets, sources of heat and away from sources of sparks, such as auxiliary power generators and invertors .
3. Safety on the Drop/Landing Zones.
- a. Safety on the Drop Zones.
 The designated Commander of the Operation will allocate responsibility for safety on the drop zones. This may include—
 - (1) Marking of the drop zone.
 - (2) Operating radio-communication facilities with aircraft in flight, and radio-electric or electronic aids.
 - (3) Clearing of the drop zone of all non-essential personnel and equipment.
 - (4) Ensuring the presence of medical personnel and means for medical evacuation (by land or by air).
 - (5) Relaying meteorological data, results or parachuting and any other information which may have an influence on the safety of the drop or the flights.
 - (6) Cancellation, postponement or renewal of the operation.
 - b. Safety on the Landing Zones.
 The Commander of the Detachment in local control of the landing zone will be responsible for—
 - (1) Inspecting runways, taxiways and hard standings prior to, and at regular intervals during the operation.
 - (2) Marking the landing zone.
 - (3) Noting and marking obstacles on the landing and take-off axis.
 - (4) Operating radio-electric and electronic facilities.
 - (5) Observing and coordinating aircraft traffic.
 - (6) Evaluating and transmitting to aircraft, data which might affect the safety of landings and take off :
 - wind (force and direction).
 - Presence of vehicles, aircraft and personnel on or near the landing zone.
 - Presence of aircraft operating within the circuit.
 - Presence of obstacles to approach or take off.
 - Enemy action.

- (7) Informing the airfield Commander if conditions become such that take-off and landing will no longer be safe. The latter will decide whether to cancel, or continue the operation and will inform the Commander of the Operation.
- (8) Relaying the orders of the Ground Commander.
- 4. Emergency procedures and signals.
 - a. Every aircraft passenger has to know procedure and emergency signals, which are to be recalled by the aircraft captain or his deputy before engines are started. Signals are tested before taxiing and may subsequently be used only in case of emergency.
 - b. Emergency signals fall into two categories: warning signals and signals of execution:
 - (1) Warning Signals.

In flight, as soon as the warning signal is given passengers are reminded by a crew member of instructions as to what should be done.

In case it is necessary to lighten the aircraft in flight, passengers designated by a crew member shall help to jettison load.

When ordered to do so, passengers shall put on or adjust emergency equipment, if provided, with the possible assistance of a crew member.

NOTE: Security signals given for take-off and landing operations should be considered as warning signals for a possible crash landing or ditching. Passengers shall unfasten seat belts only when ordered to do so in accordance with instructions given prior to the flight.
 - (2) Signals of execution.

In flight, as soon as a signal of execution is given, passengers are to comply with existing instructions or with instructions given prior to the flight and with any special orders that might be given by crew members.
 - c. (OMITTED)
 - d. Fire in Flight.

In case fire breaks out in the cabin, passengers must—

 - (1) Warn crew immediately.
 - (2) Comply with instructions given by the aircraft captain or his deputy.

5. In Flight Timing and Signal Light Procedures

- a. Timing Procedures.

Prior to the flight, the aircrew and the jumpmaster/dispatcher will confirm the desired time signals. These signals will be relayed from the loadmaster/air quartermaster to the jumpmaster/dispatcher in the following manner:

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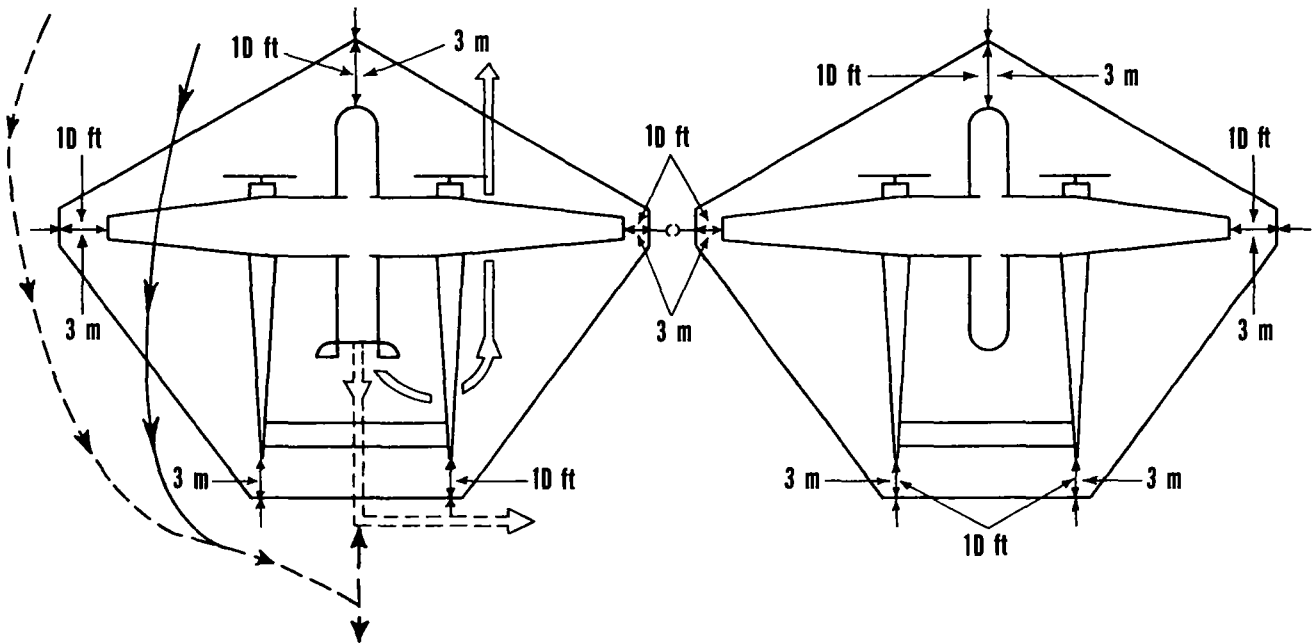
- (1) The loadmaster/air quartermaster will indicate time out from the Drop Zone with his hands, using one finger for each minute.
- (2) The jumpmaster/dispatcher will use national signals in transmitting instructions to the paratroopers.

b. Signals Light Procedures.

- (1) The preparatory red light will be turned on at the time agreed upon at the pre-flight briefing.
- (2) The red light will be turned off and the green light turned on at the time of the drop.
- (3) The green light will be turned off and the red light will be turned on when it is no longer safe to drop.

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Annex "A" to STANAG 3465 - Annexe "A" au STANAG 3465



- >— Approche autorisée - Authorized approach to the aircraft
- =>= Degagement autorisé - Authorized exit path from the aircraft
- >— Approche interdite - Forbidden approach path to the aircraft
- =>= Degagement interdit - Forbidden exit path from the aircraft

m = metres ft = feet

SAFETY PERIMETER AND VEHICLE ACCESS ROUTES TO TRANSPORT AIRCRAFT
PERIMETRE DE SECURITE ET SCHEMA D'APPROCHE ET DE DEGAGEMENT DES VEHICLES

DTAN - NON CLASSIFIE

Safety perimeter and vehicle access routes to transport aircraft.

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APPENDIX H
STANAG 3468
GENERAL RULES COVERING THE TRANSPORT OF LOADS
BY HELICOPTER

NATO—UNCLASSIFIED

Original English/French Translation

STANAG 3468

DETAILS OF AGREEMENT (DofA)

GENERAL RULES COVERING THE TRANSPORT OF LOADS
BY HELICOPTER

AGREEMENT

1. Participating nations agree that the following general rules shall apply when military cargo is carried by helicopters.

DEFINITIONS (for purposes of this agreement only).

2. a. "Helicopter Unit"—The unit operating the helicopters.
b. "User Unit"—The unit owning, or preparing, the cargo to be carried.

PROVISION OF EQUIPMENT

3. The division of responsibility for the provision of special equipment will be as follows:

a. Internal loads.

- (1) Helicopter unit—Lashing, tie downs, and any equipment organic to the helicopter unit required exclusively for helicopter transport operations.
(2) User unit—Pallets, containers and special loading aids.

b. External loads.

- (1) Helicopter unit—All equipment connected to the helicopter down to and including, the hook to engage to the load and any other equipment organic to the helicopter unit required exclusively for helicopter transport operations.
(2) User unit—All equipment required to contain or rig the load to enable it to be attached to the helicopter hook.

PROVISION OF PERSONNEL

4. The user unit will normally provide specially trained personnel to marshal helicopters to their landing points and for release and pick-up of external loads.

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5. Marshalling signals to be used are set out in STANAG 3117 (Edition No. 2) "AIRCRAFT MARSHALLING".

to hook-up external loads. When necessary, instructions on hook-up procedure will be given by the helicopter unit.

PLANNING AND PREPARATION

7. The helicopter unit will be advised on the type, weight and volume of the cargo. The helicopter unit will state which method of carriage is to be employed. If the cargo is to be carried internally, and no crew chief is carried, a lateral line with a smaller longitudinal line at its middle should be marked on the floor through the mean centre of gravity of the helicopter about which the cargo is to be evenly distributed.

8. The user unit will be informed of the type of helicopter allotted, the payload for each aircraft and method of carriage. The user unit will prepare cargo by aircraft loads and mark the weight and density loading on the complete load and on each individual element to be loaded.

9. The preparation and carriage of dangerous cargo should be in accordance with the terms of STANAG 3327 ("AIR TRANSPORTATION OF DANGEROUS CARGO") or current national regulations as applicable.

LOADING

10. The user unit is responsible for the correct loading and restraining of cargo in the helicopter and for the hook-up of an external load. If a crew chief is carried in the helicopter the user unit will follow his directions.

11. The final responsibility for the acceptance of a load, including the distribution and restraint of the internal cargo, rests with the pilot.

12. When the automatic hook-up system is in general service details of the equipment and technique will be included in this STANAG.

UNLOADING

13. The user unit is responsible for unloading cargo carried internally.

14. The recovery of slings, nets, etc. . . , is the responsibility of the user unit. However the helicopter unit can assist by back loading in helicopters returning empty.

DISCHARGE OF STATIC ELECTRICITY

15. In loading or unloading an internal or external load, if there is danger to the ground loading staff from aircraft static electricity, the responsibility for discharging the static electricity will rest with the ground personnel.

IMPLEMENTATION

16. This agreement will be considered to have been implemented when the provisions of the Details of Agreement (para 1-15 above) have been included in the appropriate national standing orders or manuals.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-11 requirements for AAVN Transport Service and Units in field army.





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FM 55-46 ARMY AIR TRANSPORT OPERATIONS-1967

